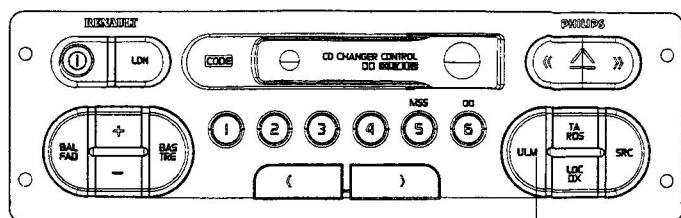


# Service Service Service

22DC594 / 62E / 62S



For repair information of the Cassette deck see Service Manual No 4822 725 25459 of Auto Cassette Deck SCA\*5-4 for DC594/62E/S 4822 725 xxxx of Auto Cassette Deck P1-18 for DC593/62E

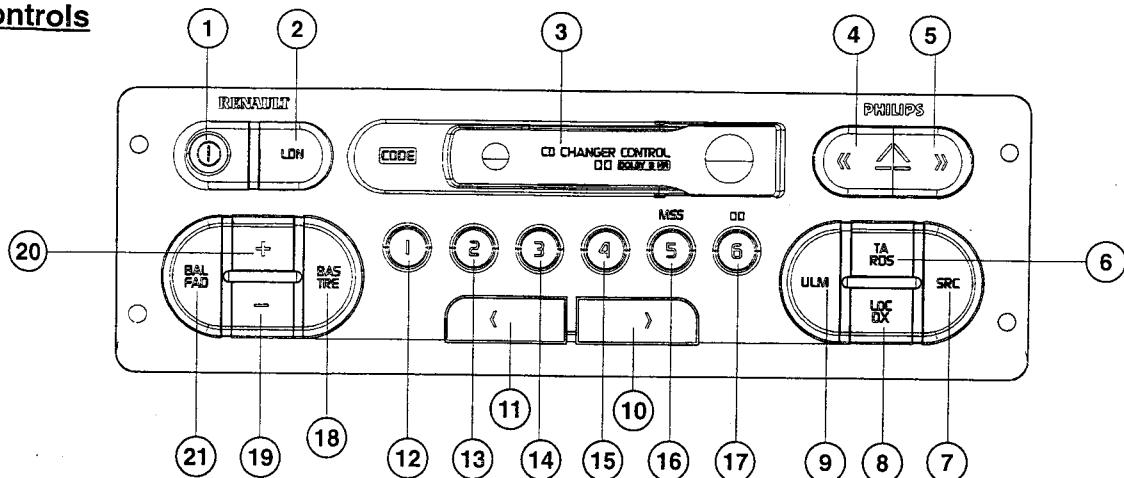
# Service Manual

12V

## Contents

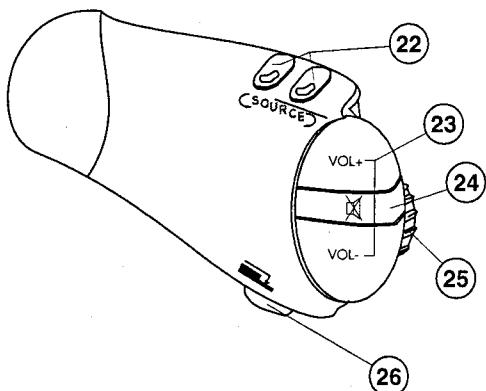
	page
Controls .....	2
Connections - technical data .....	3 - 3a
Security code - System tests .....	4 - 4a
Semiconductors - IC pinnings.....	5 - 5a
Checks and alignments - DC voltages .....	6 - 6a
Electrical block diagram.....	7 - 7a
Front PWB layout - Front electrical partslist .....	8 - 8a
Front PWB schematic diagram.....	9 - 9a
Tuner Module - Schematic diagram.....	10 - 10a
Microcontroller part schematic diagram.....	11 - 11a
Main PWB layout .....	12 - 12a
Power supply part schematic diagram.....	13 - 13a
Signal processing part schematic diagram.....	14 - 14a
Main PWB layout .....	15 - 15a
Tape part schematic diagram .....	16 - 16a
Power amplifier part schematic diagram DC593/6E .....	17 - 17a
Power amplifier part schematic diagram DC594/62E./62S.....	18 - 18a
Exploded view - mechanical partslist.....	19 - 19a
Electrical partslist.....	20 - 20a - 21 - 22
Technician's remarks .....	23

## Controls



POS	22DC593/62E	22DC594/62S	22DC594/62E
1		On / Off	
2		Loudness	
3		Cassette opening + flap	
4	4 + 5 = ejection	FRW button	
5		FFW Button	
6		Info / Traffic announcement	
7		Source	
8		DX mode / Local mode	
9		Band Select	
10	Search UP		Search UP / Next track
11	Search DOWN		Search DOWN / Previous track
12	Preset 1		Preset 1 / Scan / Disk 1
13	Preset 2		Preset 2 / Scan / Disk 2
14	Preset 3		Preset 3 / Scan/ Disk 3
15	Preset 4		Preset 4 / Scan / Disk 4
16	Preset 5	Preset 5 / MSS	Preset 5 / MSS / Scan / Disk 5
17	Preset 6	Preset 6 / Dolby	Preset 6 / Dolby / Scan / Disk 6
18	Bass / Treble		
19	Vol , Bass, Treble, Balance -	Vol , Bass, Treble, Balance, Fader -	
20	Vol , Bass, Treble, Balance +	Vol , Bass, Treble, Balance, Fader +	
21	Balance	Balance / Fader	

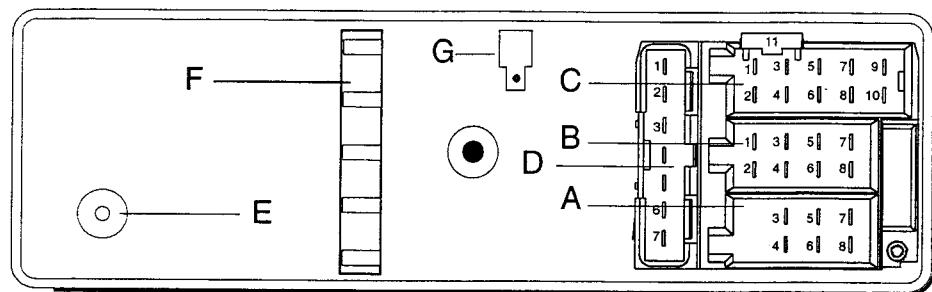
## Remote control



22	Change waveband/source	
23	Vol , Bass, Treble, Fader + and - when corresponding function activated	
24	In code entry mode: SP : Validation digit Sec Code LP : Validation Sec Code	All others modes: Mute / Demute
25	In code entry mode: Selection digits Sec Code	Changing preset / Track selection
26	In code entry mode: SP : Validation digit Sec Code LP : Validation Sec Code	
	In radio mode: SP : search UP LP : Starts Autostore	

SP : Short press      LP : Long press (>2s)

CONNECTIONS



POS	FUNCTION	DC593/62E	DC594/62S	DC594/62E
A1				
A2				
A3	Mute radio (0V)	X	X	X
A4	Plus permanent	X	X	X
A5	+ Antenna	X	X	X
A6	Pilot light	X	X	X
A7	Plus accessories	X	X	X
A8	GND	X	X	X
B1	Rear right +		X	X
B2	Rear right -		X	X
B3	Front right +	X	X	X
B4	Front right -	X	X	X
B5	Front left +	X	X	X
B6	Front left -	X	X	X
B7	Rear left +		X	X
B8	Rear left -		X	X
C1	Screening D2B			X
C2	Bus D2B +			X
C3	Bus D2B -			X
C4	GND supply			X
C5	CD supply (A4)			X
C6				
C7	Info on / off (A5)			X
C8	input right			X
C9	Input left			X
C10	Input ref			X
C11	Screening CD			X
D1	Data I2C	X	X	X
D2	Clock I2C	X	X	X
D3	Mrq I2C	X	X	X
D4				
D5				
D6	+ antenna	X	X	X
D7	GND	X	X	X
E	AERIAL PLUG	X	X	X
F	Fastening cable	X	X	X

## TECHNICAL DATA

### **GENERAL**

Power supply : 14.4V DC  
 Dimensions : 180x150x51 mm  
 Security code : Yes  
 Remote control : Yes  
 Remote display : Yes

### **RADIO**

LW : 153-279 KHz  
 MW : 531-1602 KHz  
 FM : 87.5-108 MHz  
 IF-AM (1/2) : 10.7 MHz/450 KHz  
 IF-FM (1/2) : 72.2 MHz/10.7 MHz  
 Sensivity 26dB S/N : <40 µV (LW)  
                       : <40 µV (MW)  
                       : 3.5 µV (FM)  
 Limitation α-3dB : 3µV<L<14µV

### **CASSETTE**

Cassette mechanism  
 Number of tracks  
 Tape speed  
 Wow and flutter  
 Crosstalk

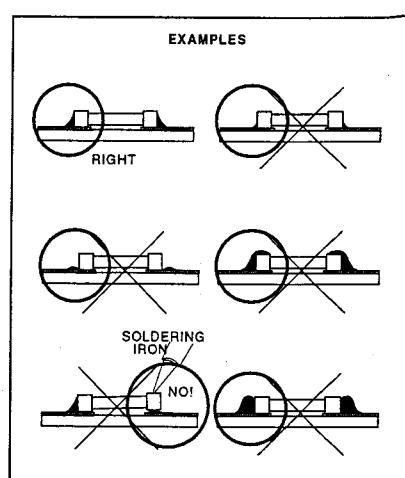
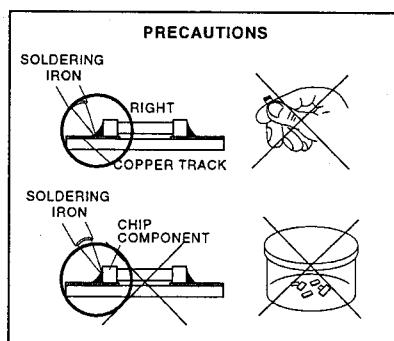
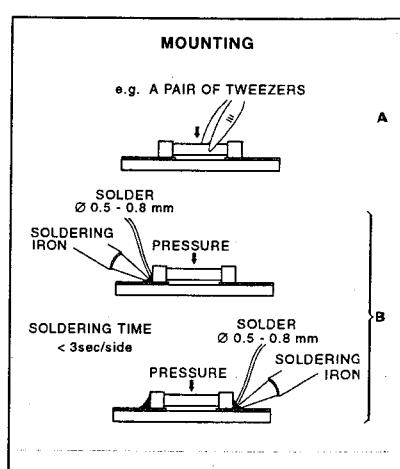
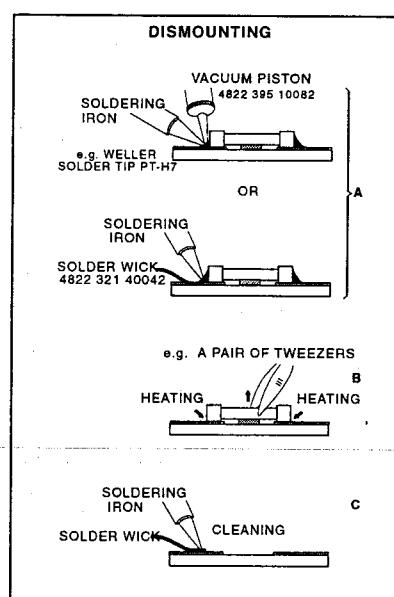
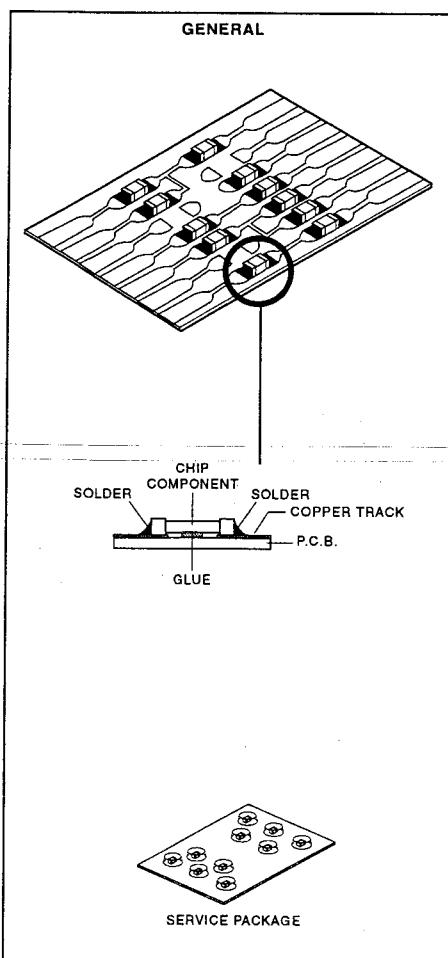
: LCA 5.4 for DC594\*  
 : P1.18 for DC593  
 : 2 or 2x2\*  
 : 4.76 cm/sec  
 : ≤ 0.35%  
 : ≥ 30 dB

### **AMPLIFIER**

Output power  
 Fader control  
 Balance control  
 Source separation  
 Input sensivity (CD in)

: 4x15 W / 4 Ω (THD = 10%) DC594  
 : 2x6W / 4 Ω (THD = 10%) DC593  
 : >12 dB (DC594 only)  
 : >15 dB  
 : >60 dB  
 : 150 mV ± 2 dB

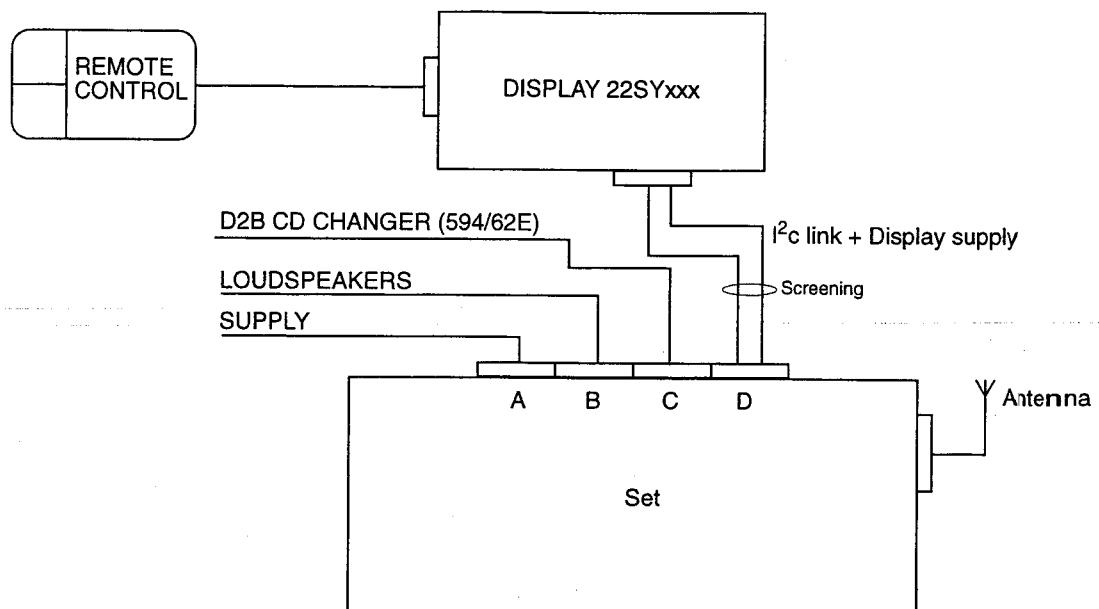
## **HANDLING CHIP COMPONENTS**



These sets are parts of a system, composed of the following parts:

- 1)- The set 22DC593/62E, 594/62E or 594/62S.
- 2)- A remote control + cable.
- 3)- A remote display 22SY664, 654, or 656.
- 4)- A cable link between the set (connector D) and the display.

**-IN CASE YOU NEED PARTS OF THIS SYSTEM, PLEASE CONTACT LOCALLY RENAULT TO GET INFO ABOUT THESE PARTS.**



This set is protected by a security code. **THE CODE CAN ONLY BE ENTERED VIA THE REMOTE CONTROL**

Entering the code:

- ) Press the On/Off key to switch on the set. COD and then 0000 will appear on the display.
- ) To select the four digits of the code:
  - Adjust the flashing digit with the thumbwheel on the remote control.
  - Press the [24] key or [26] key on the remote control to change the digit.
- ) Press the [24] key or [26] key for at least 2 seconds to validate the code.

When the code is activated a bleep will be heard.

Example : you want to enter the code 7637

	Turn the thumbwheel Press [24] or [26]	Press [24] or [26] for at least 2 seconds			
0000	7000	7600	7630	7637	Last heard frequency

## SYSTEM TESTS

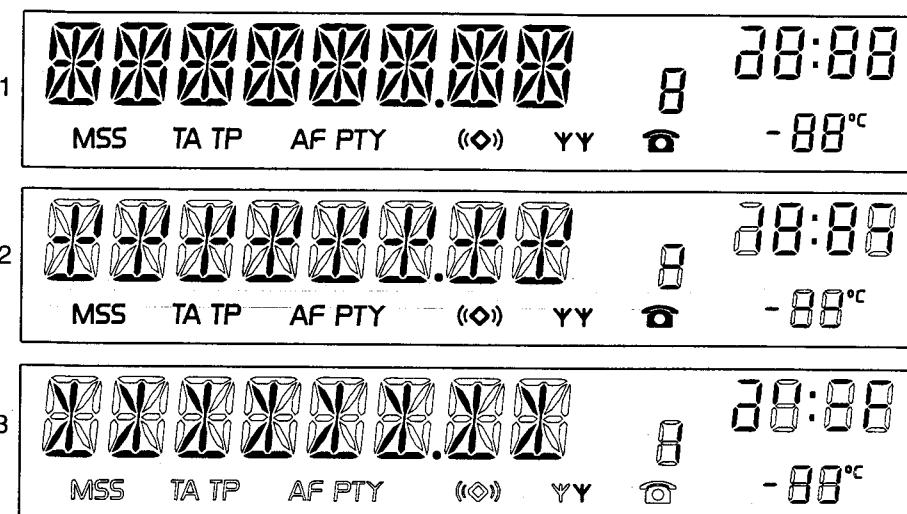
WARNING: this test needs a display 22SY656/62B to be completed

### 1 - Display connection check

Starting the test: supply the display with the 12V acc without radio connected or radio switched off while <Vol+>sat, <Vol->sat and <SOURCE>sat are pressed together.

If there is no problem, the following test will start.

The display shows 3 different screens:



These screens are displayed in sequence each time you press the <26>sat button. It can be aborted by Switching On the set.

### 2 - Keyboard test

Starting the test: press P3 and ON.

"T" is displayed to request keyboard test. For each key pressed, the number of the pressed key appears, according to the table shown below. When all 17 keys have been pressed, "TEST OK" message is displayed.

This test can be aborted at any time by switching the set OFF.

number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
key	LDN	BAL FAD	+	-	BAS TRE	Pr 1	Pr 2	Pr 3	Pr 4	Pr 5	Pr 6	ULM	TA	DX	SRC	<	>

If all is right, the display shows "KEYS OK"

### 3 - Check sum and Running times (Multiples of ten minutes)

At the end of the keyboard test, press P3 to start this test.

The display will show in order, during 5s each :

- 1) the checksum of the front microprocessor : CSF XXXX (depending on the software release)
- 2) the checksum of the main microprocessor : CSM XXXX (depending on the software release)
- 3) the running time in tuner mode : TU ....
- 4) the running time in cassette mode : TA ....
- 5) the running time in Cd changer mode : CDC ....
- 6) the running time in Traffic Announcement : TR ....
- 7) the running time in Telephone Call : SP ....
- 8) the total running time : TOT ....
- 9) the running time in nominal mode I<sup>2</sup>C : NOM ....

These indications are displayed in a loop. To end the test, switch Off the set.

22DC593/62E  
22DC594/62E  
22DC594/62S

## INTEGRATED CIRCUITS

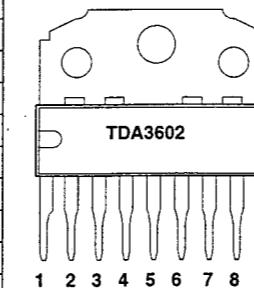
SAA6579T Radio Data System demodulator

SYMBOL	PIN	DESCRIPTION
QUAL	1	quality indication output
RDDA	2	RDS data output
V <sub>ref</sub>	3	reference voltage output (0.5 V <sub>DDA</sub> )
MPX	4	multiplex input signal
V <sub>DDA</sub>	5	+5V supply voltage for analog part
V <sub>SSA</sub>	6	ground for analog part (0V)
CIN	7	subcarrier input to comparator
SCOUT	8	subcarrier output for reconstruction filter
TCTR	9	test control
TEN	10	test enable
V <sub>SSD</sub>	11	ground for digital part (0V)
V <sub>DDD</sub>	12	+5V supply voltage for digital part
OSCI	13	oscillator input
OSCO	14	oscillator output
T57	15	57kHz clock signal output
RDCL	16	RDS clock output



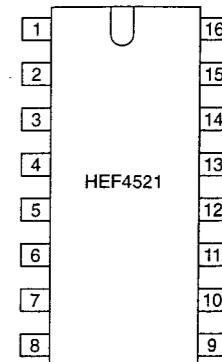
TDA3602 Multiple output voltage regulator

SYMBOL	PIN	DESCRIPTION
V <sub>P</sub>	1	positive supply voltage
REG1	2	regulator 1 output
RESET	3	reset output
SCI	4	state control input
HOLD	5	hold output
GND	6	ground
REG3	7	regulator 3 output
V <sub>bu</sub>	8	back-up
REG2	9	regulator 2 output



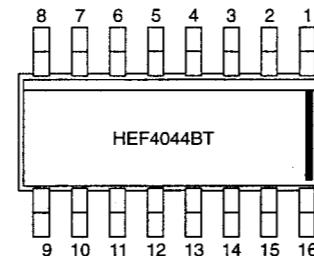
HEF4521BP 24-stage frequency divider

SYMBOL	PIN	DESCRIPTION
O <sub>24</sub>	1	output 2 <sup>24</sup>
MR	2	asynchronous master reset
V <sub>SS</sub>	3	
O <sub>2</sub>	4	
V <sub>DD</sub>	5	
I <sub>2</sub>	6	
O <sub>1</sub>	7	
V <sub>SS</sub>	8	ground
I <sub>1</sub>	9	
O <sub>18</sub>	10	output 2 <sup>18</sup>
O <sub>19</sub>	11	output 2 <sup>19</sup>
O <sub>20</sub>	12	output 2 <sup>20</sup>
O <sub>21</sub>	13	output 2 <sup>21</sup>
O <sub>22</sub>	14	output 2 <sup>22</sup>
O <sub>23</sub>	15	set input 3 (active LOW)
V <sub>DD</sub>	16	power supply



HEF4044BT Quad R/S latch with 3-state outputs

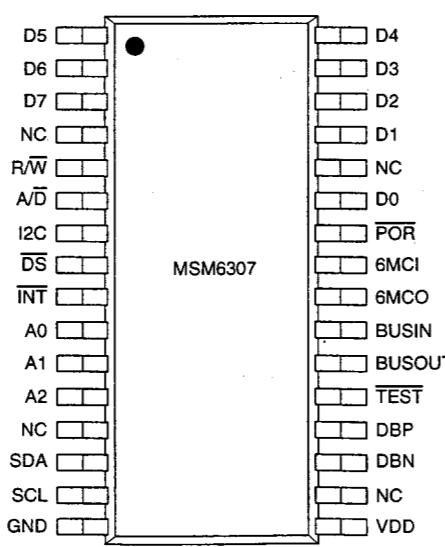
SYMBOL	PIN	DESCRIPTION
O <sub>3</sub>	1	3-state buffered latch output 3
n.c.	2	
$\bar{S}_0$	3	set input 0 (active LOW)
$\bar{R}_0$	4	reset input 0 (active LOW)
E <sub>0</sub>	5	common output enable input
$\bar{R}_1$	6	reset input 1 (active LOW)
$\bar{S}_1$	7	set input 1 (active LOW)
V <sub>SS</sub>	8	ground
O <sub>1</sub>	9	3-state buffered latch output 1
O <sub>2</sub>	10	3-state buffered latch output 2
$\bar{S}_2$	11	set input 2 (active LOW)
$\bar{R}_2$	12	reset input 2 (active LOW)
O <sub>0</sub>	13	3-state buffered latch output 0
$\bar{R}_3$	14	reset input 3 (active LOW)
$\bar{S}_3$	15	set input 3 (active LOW)
V <sub>DD</sub>	16	supply



FUNCTION TABLE	
inputs	output O <sub>n</sub>
E <sub>0</sub> $\bar{S}_n$ $\bar{R}_n$	Z
L X X	
H L H	H
H X L	L
H H H	latched
Z = high impedance OFF-state	

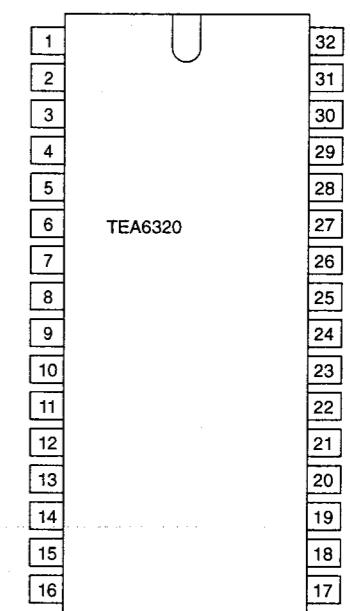
MSM6307GS D<sup>2</sup>B IC

SYMBOL	I/O	DESCRIPTION
$\overline{\text{POR}}$	I	Power on - reset
R/W	I	Read / Write selector
DS	I	Data strobe to access data bus
A/D	I	Selects address or data on D0 - d7
SDA	I/O	I <sup>2</sup> C data signal input / output
SCL	I/O	I <sup>2</sup> C clock signal input / output
I <sup>2</sup> C	I	Selects I <sup>2</sup> C or parallel interface
INT	O	Interrupt output
BUSIN	I	D2B input (TTL level)
BUSOUT	O	D2B output (TTL level)
DBN & DBP	I/Os	Differential D2B lines of the internal driver/receiver, to be terminated with 60Ω
TEST	I	Selects the test mode for factory purposes
6MCI	I	Clock input 6MHz resonator or X-TAL
6MCO	O	Clock output 6MHz resonator or X-TAL
D0 ~ D7	I/Os	8-bit bi-directional address or data bus
A0 ~ A2	I	Programmable I <sup>2</sup> C slave addresses

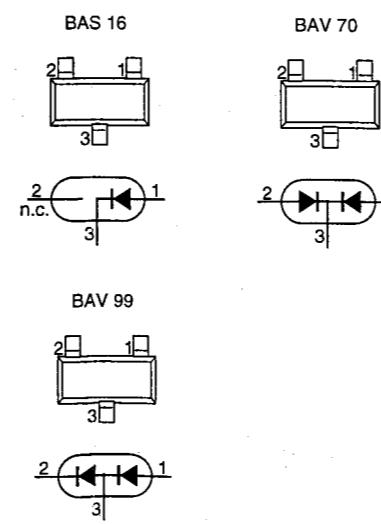


TEA6320 SOFAC (SOund FAder Control circuit)

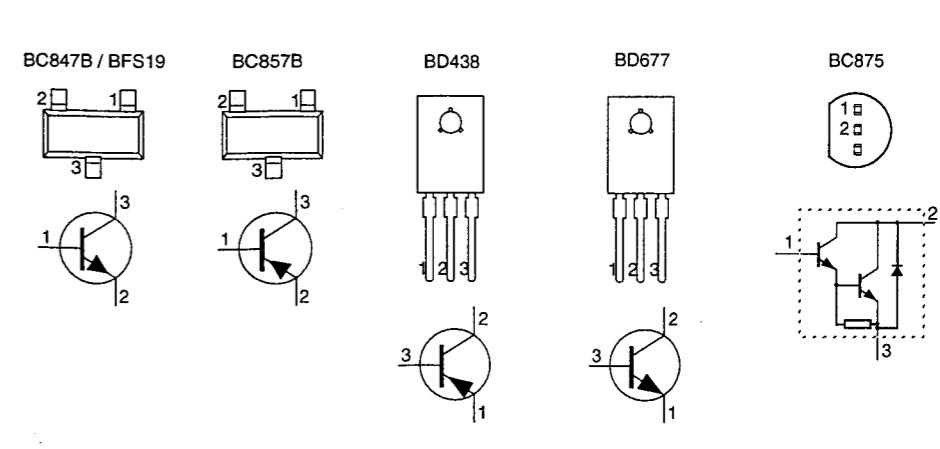
SYMBOL	PIN	DESCRIPTION	SYMBOL	PIN	DESCRIPTION
SDA	1	serial data input/output	IAR	17	input A right source
GND	2	ground	IBR	18	input B right source
OUTLR	3	output left rear	CAP	19	electronic filtering for supply
OUTLF	4	output left front	ICR	20	input C right source
TL	5	treble control capacitor left channel or input from an external equalizer	V <sub>ref</sub>	21	reference voltage (0.5Vcc)
B2L	6	bass control capacitor left channel or output to an external equalizer	IDR	22	input D right source
B1L	7	bass control capacitor, left channel	QSR	23	output source selector right channel
IVL	8	input volume l, left control part	ILR	24	input loudness right channel
ILL	9	input loudness, left control part	IVR	25	input volume l, right control part
QSL	10	output source selector, left channel	B1R	26	bass control capacitor, right channel
IDL	11	input D left source	B2R	27	bass control capacitor right channel or output to an external equalizer
MUTE	12	mute control	TR	28	treble control capacitor right channel or input from an external equalizer
ICL	13	input C left source	OUTRF	29	output right front
IMO	14	input mono source	OUTRR	30	output right rear
IBL	15	input B left source	V <sub>cc</sub>	31	supply voltage
IAL	16	input A left source	SCL	32	serial clock input



DIODES



TRANSISTORS



## DC VOLTAGES

All measurements in FM, set tuned, 0dB at output.  
All settings in mid position. Values are given for indication only.

### IC91 TUNER MODULE

1 = 0.5 V	11 = 2.9 V
2 = GND	12 = 4.7 V
3 = N.C.	13 = 4.9 V
4 = N.C.	14 = 4.8 V
5 = N.C.	15 = N.C.
6 = 4.9 V	16 = 3.6 V
7 = 8.3 V	17 = 3.6 V
8 = GND	18 = 0.0 V
9 = 4.9 V	19 = N.C.
10 = 4.6 V	20 = N.C.

### 7257 LA2000

1 = 1.8 V	6 = 5.0 V
2 = 7.3 V	7 = N.C.
3 = 2.1 V	8 = N.C.
4 = N.C.	9 = 8.5 V
5 = GND	

### 7350 TDA8579T

1 = 4.8 V	5 = GND
2 = 5.0 V	6 = 4.4 V
3 = 4.8 V	7 = 4.4 V
4 = 5.2 V	8 = 8.5 V

### 7354 TEA6320

1 = 5.0 V	17 = 3.7 V
2 = GND	18 = 3.9 V
3 = 3.6 V	19 = 7.6 V
4 = 3.9 V	20 = 4.4 V
5 = 3.9 V	21 = 3.9 V
6 = 3.9 V	22 = N.C.
7 = 3.9 V	23 = 3.7 V
8 = 3.5 V	24 = 3.8 V
9 = 3.8 V	25 = 3.5 V
10 = 3.7 V	26 = 3.9 V
11 = N.C.	27 = 3.9 V
12 = 7.6 V	28 = 3.9 V
13 = 4.4 V	29 = 3.9 V
14 = 3.8 V	30 = 3.9 V
15 = 3.9 V	31 = 7.6 V
16 = 3.6 V	32 = 5.0 V

### 7355 SAA6579T

1 = N.C.	9 = GND
2 = 3.1 V	10 = GND
3 = 2.5 V	11 = GND
4 = 2.5 V	12 = 4.9 V
5 = 4.9 V	13 = 4.332 MHz
6 = GND	14 = 4.332 MHz
7 = 2.3 V	15 = N.C.
8 = 2.5 V	16 = 3.5 V

### 7356 TL074

1 = 4.2 V	8 = 4.2 V
2 = 4.2 V	9 = 4.3 V
3 = 4.1 V	10 = 4.1 V
4 = 8.2 V	11 = GND
5 = 4.1 V	12 = 4.2 V
6 = 4.3 V	13 = 4.2 V
7 = 4.2 V	14 = 4.2 V

### 7551 TDA7374

1 = 7.0 V	9 = GND
2 = 7.0 V	10 = 0.0 V
3 = 14.4 V	11 = 0.7 V
4 = 0.7 V	12 = 0.7 V
5 = 0.7 V	13 = 14.4 V
6 = 0.7 V	14 = 7.0 V
7 = 3.3 V	15 = 7.0 V
8 = Earth	

### 7251 TEA0675T

1 = 4.0 V	13 = 4.0 V
2 = 3.4 V	14 = GND
3 = 3.9 V	15 = N.C.
4 = 3.9 V	16 = GND
5 = 3.9 V	17 = 4.0 V
6 = 5.6 V	18 = 4.0 V
7 = 4.0 V	19 = 4.5 V
8 = 4.0 V	20 = 3.9 V
9 = 8.2 V	21 = 0.6 V
10 = 3.6 V	22 = 3.4 V
11 = 4.0 V	23 = 3.0 V
12 = 4.0 V	24 = 4.0 V

### 7601 ST24C16

1 = 5.0 V	5 = 5.0 V SDA
2 = 5.0 V	6 = 5.0 V SCL
3 = 5.0 V	7 = GND
4 = GND	8 = 5.0 V

### 7602 HEF4521

1 = N.C.	9 = 2.5 V
2 = GND	10 = 1 Hz □□
3 = GND	11 = N.C.
4 = 3.5 V	12 = N.C.
5 = 5.0 V	13 = N.C.
6 = 3.5 V	14 = N.C.
7 = 3.5 V	15 = N.C.
8 = GND	16 = 5.0 V

### 7603 MSM6307GS

1 = 5.0 V	17 = 5.0 V
2 = 5.0 V	18 = N.C.
3 = 5.0 V	19 = 2.3 V
4 = N.C.	20 = 2.3 V
5 = 5.0 V	21 = 5.0 V
6 = 5.0 V	22 = N.C.
7 = 5.0 V	23 = 5.0 V
8 = 5.0 V	24 = 5.75 MHz
9 = 5.0 V	25 = 5.75 MHz
10 = 5.0 V	26 = 4.8 V
11 = 5.0 V	27 = 5.0 V
12 = 5.0 V	28 = N.C.
13 = N.C.	29 = 5.0 V
30 = 5.0 V	31 = 5.0 V
31 = 5.0 V	32 = 5.0 V

### 7800 TDA3602

1 = 13.4 V	6 = GND
2 = 8.5 V	7 = 5.0 V
3 = N.C.	8 = 13.2 V
4 = 0.6 V	9 = 5.0 V
5 = 5.0 V	

### 7826 HEF 4044BT

1 = 0.0 V	9 = 5.0 V
2 = N.C.	10 = 0.0 V
3 = 3.5 V	11 = 4.8 V
4 = 4.6 V	12 = 5.0 V
5 = 5.0 V	13 = 5.0 V
6 = 4.0 V	14 = 5.0 V
7 = 5.0 V	15 = 5.0 V
8 = GND	16 = 5.0 V

## Check and Alignment

No alignment is needed for radio part. IC91 tuner is pre-aligned.

For all measurement, please refer to "General Check & Alignment procedures for Car Systems"  
4822 725 25456

### Dolby alignment:

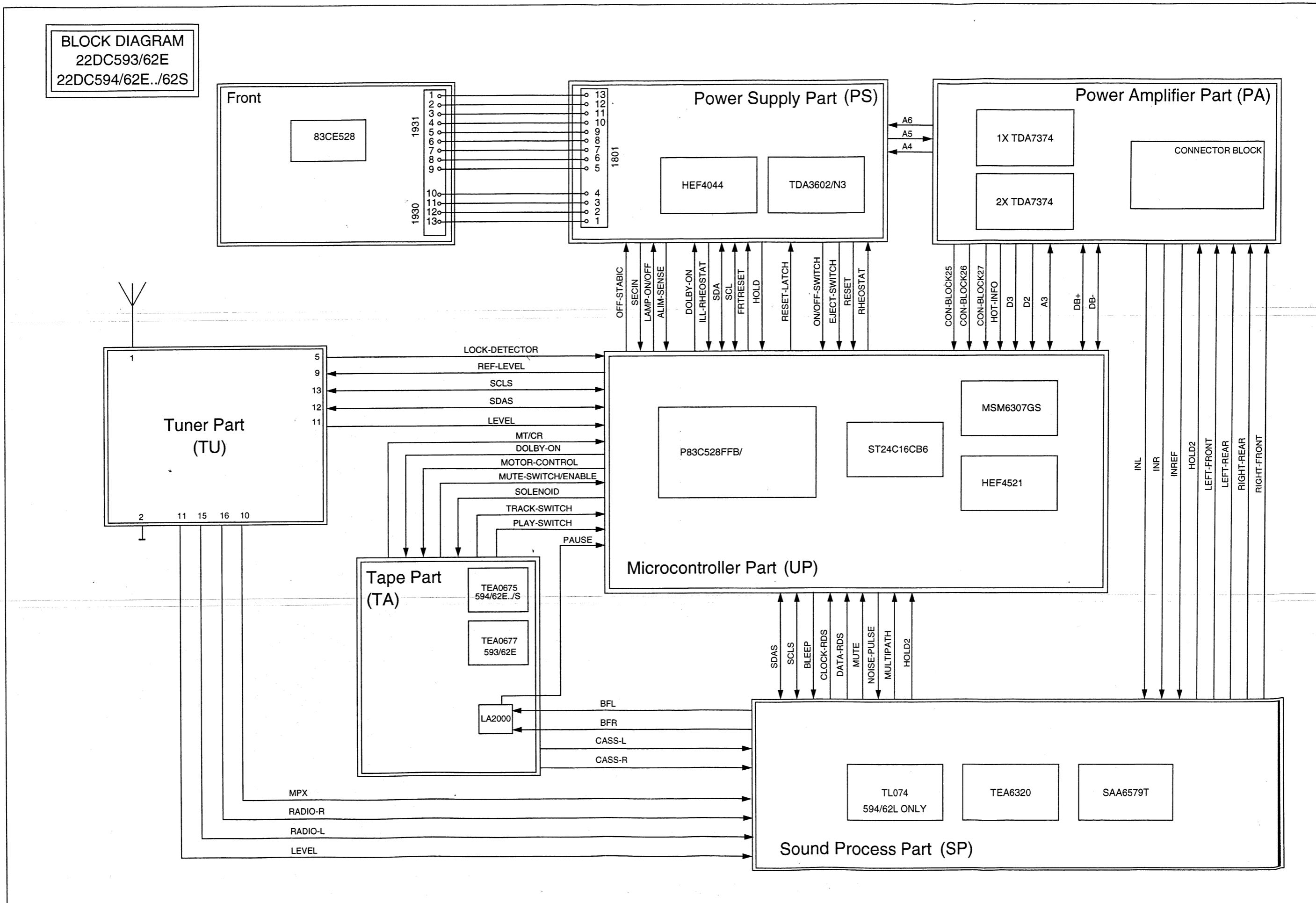
cassette	adjust
MTT 150 F = 400 Hz / 200 nWb	3260 and 3261 AC voltage at pin 1 & 24 of 7251 = 387.5 mV +/- 50mV

### Checks:

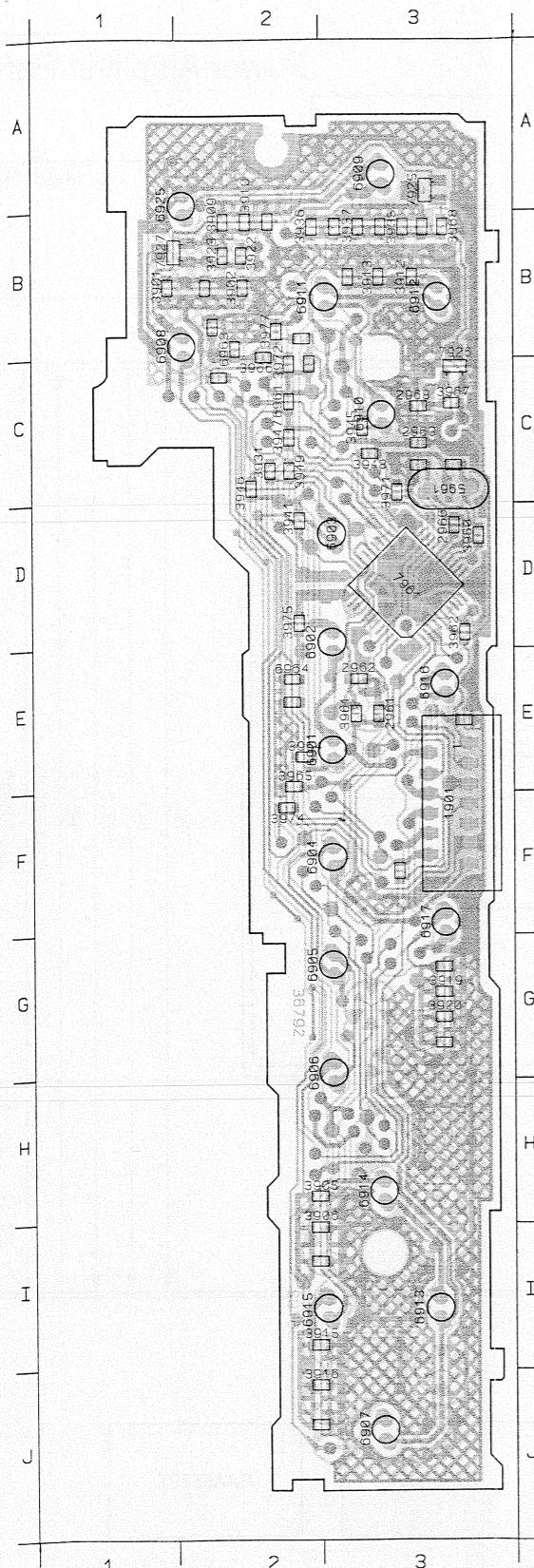
#### Supply voltages (set Off)

SET OFF	Voltage	Current + Acc ON	Current + Acc OFF	Pin 14 $\mu$ P	Pin 69 $\mu$ P
Acc supply	+14.4V	< 20mA	</		

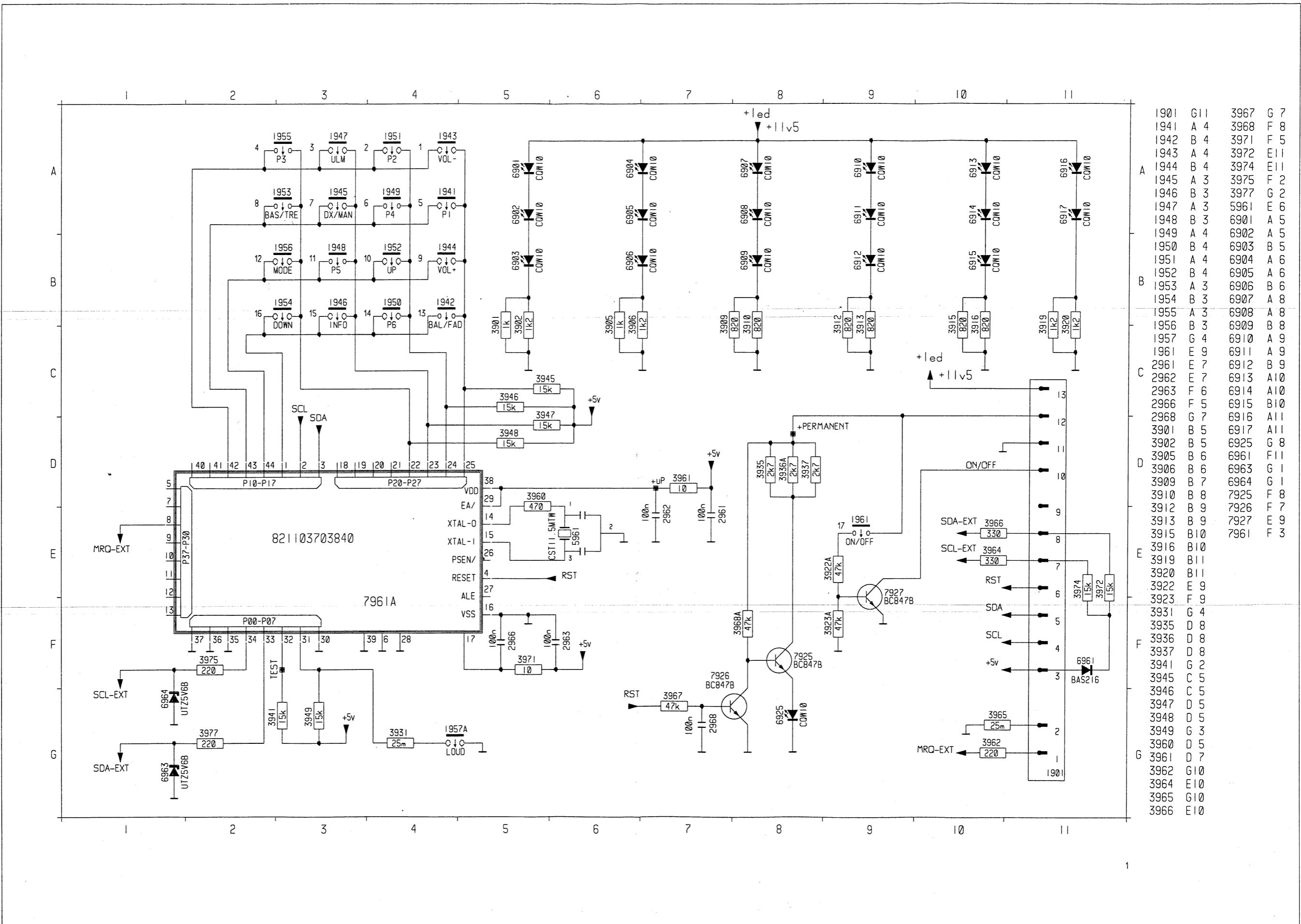
BLOCK DIAGRAM  
22DC593/62E  
22DC594/62E../62S



## FRONT PWB

22DC593/62E  
22DC594/62E../62S

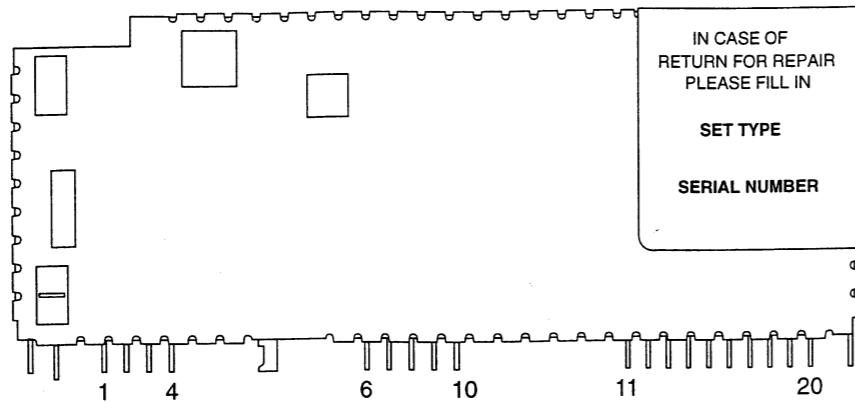
 2961    4822 126 13196    100N 10% 25V X7R 0805	 6961    4822 130 83757    DIODE BAS216
 2962    4822 126 13196    100N 10% 25V X7R 0805	 6963    4822 130 10185    DIODE REG SM UDZ5.6B
 2963    4822 126 13196    100N 10% 25V X7R 0805	 6964    4822 130 10185    DIODE REG SM UDZ5.6B
 2966    4822 126 13196    100N 10% 25V X7R 0805	
 2968    4822 126 13196    100N 10% 25V X7R 0805	
 3901    4822 051 20102    1K00 5% 0,1W	 7925    4822 130 60511    BC847B
 3902    4822 051 20122    1K20 5% 0,1W	 7926    4822 130 60511    BC847B
 3905    4822 051 20102    1K00 5% 0,1W	 7927    4822 130 60511    BC847B
 3906    4822 051 20122    1K20 5% 0,1W	 7961    4822 209 13611    P83CE528EFB/017
 3909    4822 051 20821    820R00 5% 0,1W	
 3910    4822 051 20821    820R00 5% 0,1W	
 3912    4822 051 20821    820R00 5% 0,1W	
 3913    4822 051 20821    820R00 5% 0,1W	
 3915    4822 051 20821    820R00 5% 0,1W	
 3916    4822 051 20821    820R00 5% 0,1W	
 3919    4822 051 20122    1K2 5% RC11 0805	
 3920    4822 051 20122    1K2 5% RC11 0805	
 3922    4822 051 20473    47K 5%.0805 RC11	
 3923    4822 051 20473    47K 5% 0805 RC11	
 3935    4822 051 20272    2K70 5% 0,1W	
 3936    4822 051 20272    2K70 5% 0,1W	
 3937    4822 051 20272    2K70 5% 0,1W	
 3941    4822 051 20223    22K 5% RC11 0805	
 3945    4822 051 20153    15K 5% 0805 RC11	
 3946    4822 051 20153    15K 5% 0805 RC11	
 3947    4822 051 20153    15K 5% 0805 RC11	
 3948    4822 051 20153    15K 5% 0805 RC11	
 3949    4822 051 20153    15K 5% 0805 RC11	
 3961    4822 051 20109    10R00 5% 0,1W	
 3962    4822 051 20221    220R 5% 0805 RC11	
 3964    4822 051 20331    330R 5% RC11 0805	
 3965    4822 051 20008    CHIP JUMPER MAX 0R05	
 3967    4822 051 20473    47K 5% RC11 0805	
 3968    4822 051 20473    47K 5% RC11 0805	
 3971    4822 051 20221    220R 5% RC11 0805	
 3972    4822 051 20153    15K 5% RC11 0805	
 3973    4822 051 20153    15K 5% RC11 0805	
 3975    4822 051 20221    220R 5% RC11 0805	
 3977    4822 051 20221    220R 5% RC11 0805	
 5961    4822 242 10435    CER RES 12MHZ	
 6901    4822 130 10417    LED SM LOT670-JK-E9139/40	
 6902    4822 130 10417    LED SM LOT670-JK-E9139/40	
 6903    4822 130 10417    LED SM LOT670-JK-E9139/40	
 6904    4822 130 10417    LED SM LOT670-JK-E9139/40	
 6905    4822 130 83963    LED LO3360 ORANGE	
 6906    4822 130 83963    LED LO3360 ORANGE	
 6907    4822 130 83963    LED LO3360 ORANGE	
 6908    4822 130 83963    LED LO3360 ORANGE	
 6909    4822 130 83963    LED LO3360 ORANGE	
 6910    4822 130 83963    LED LO3360 ORANGE	
 6911    4822 130 83963    LED LO3360 ORANGE	
 6912    4822 130 83963    LED LO3360 ORANGE	
 6913    4822 130 83963    LED LO3360 ORANGE	
 6914    4822 130 83963    LED LO3360 ORANGE	
 6915    4822 130 83963    LED LO3360 ORANGE	
 6916    4822 130 83963    LED LO3360 ORANGE	
 6917    4822 130 83963    LED LO3360 ORANGE	
 6925    4822 130 83963    LED LO3360 ORANGE	



## IC91 MODULE

Do not open nor try to repair yourself!

This module is a Service Part as a complete sub-assembly and must be ordered with the normal procedure.



### Connections

1 AM/FM Aerial input	11 Multiplex / RDS output signal
2 Ground	12 Unweighted level output
3 Not used	13 I <sup>2</sup> C SDA
4 Not used	14 I <sup>2</sup> C SCL
6 Output lock detector	15 Not used
7 Vcc 8.5V	16 Output Left
8 Ground	17 Output Right
9 Vcc 5.0V	18 Ground
10 V reference	19 Not used
	20 Not used

### Quick reference data:

- 1) AM part  
 -Longwave/Mediumwave 144-1710 KHz  
 -Shortwave 5900-6250 KHz  
 -AM double super concept  
 -AM IF1 10.7MHz  
 -AM IF2 450KHz  
 -First VCO frequency above input signal frequency  
 -Second X-tal oscillator frequency below IF1  
 -Usable sensivity  $\alpha 26dB$  MW =  $14\mu V$  typ.

- 1) FM part  
 -FM 87.5 - 108MHz  
 -FM double super concept  
 -FM IF1 72.2MHz  
 -FM IF2 10.7MHz  
 -First VCO frequency above input signal frequency  
 -Second X-tal oscillator frequency below IF1  
 -Usable sensivity  $\alpha 26dB$  =  $2.5\mu V$  typ.  
 -THD 1mV  $\delta f=75KHz$  = 0.4% typ  
 -Signal to noise ratio = 65dB typ  
 -Locktime synthetizer <2mSec

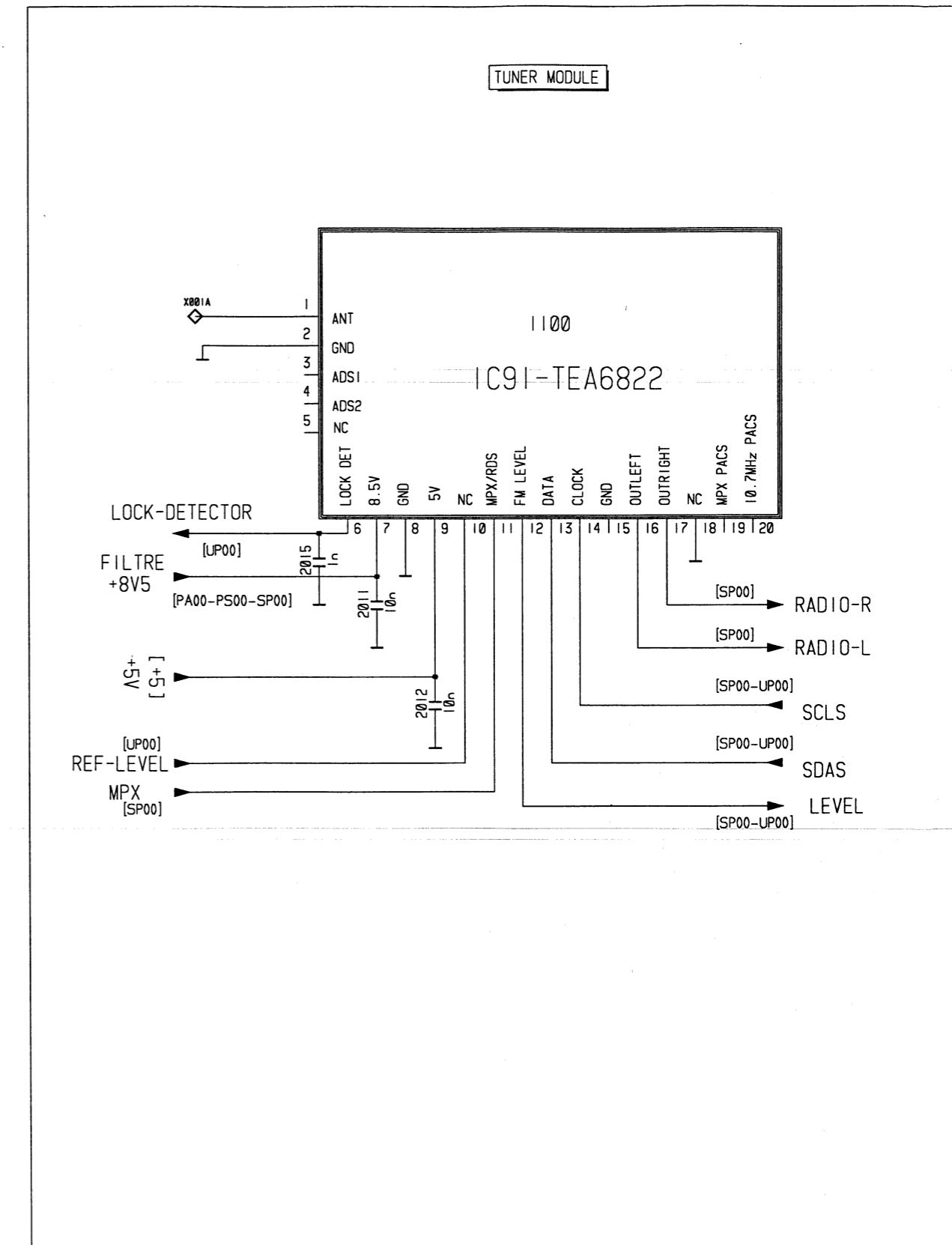


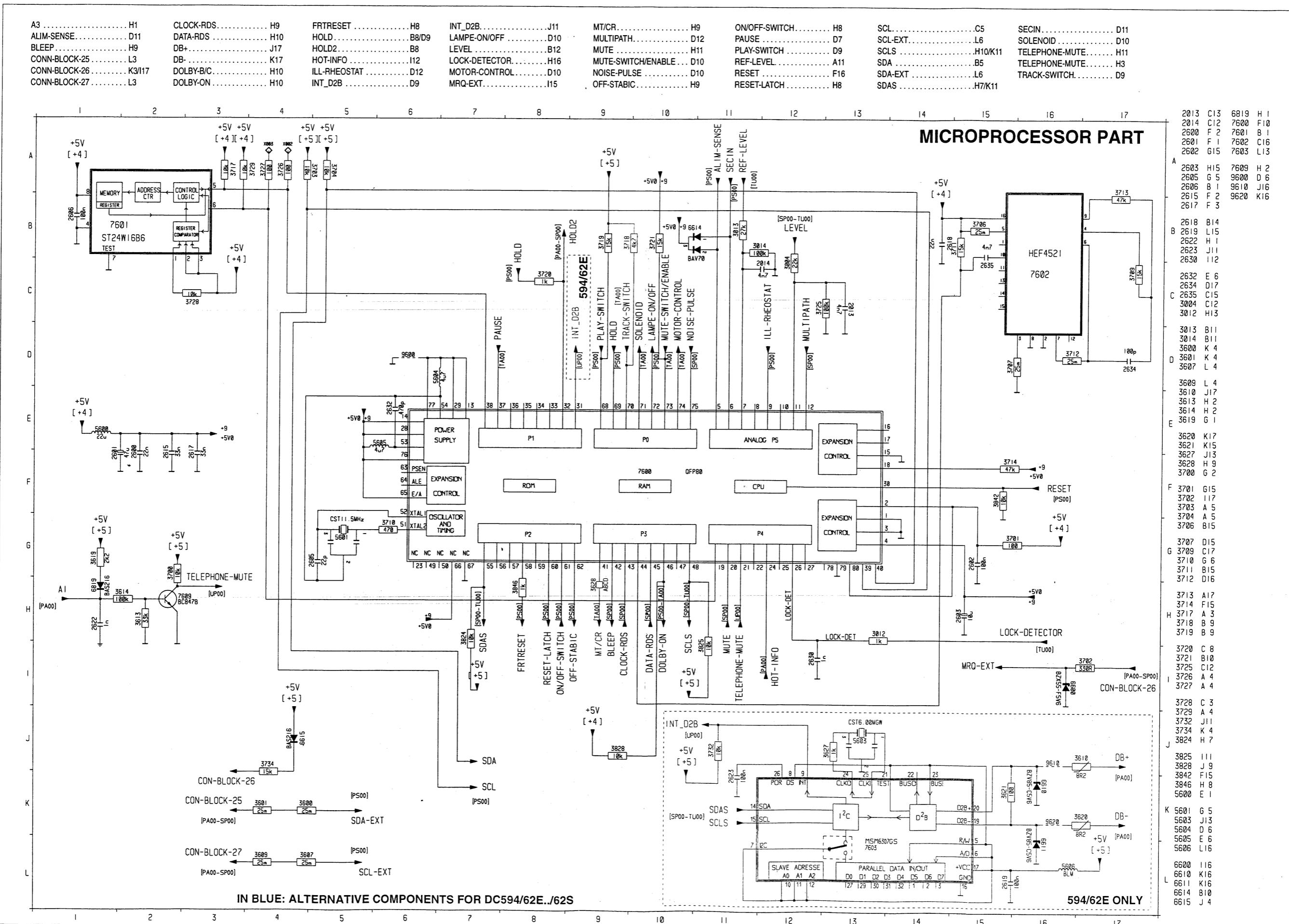
### **WARNING**

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

### ESD equipment available:

Anti-static table mat large 100X650X1.25mm	4822 466 10953
small 600X650X1.25mm	4822 466 10958
Connection box (1Mohm)	4822 395 10223
Extendible cable (to connect wrist band to connection box)	4822 320 11307
Connecting cable (to connect table mat to connection box)	4822 320 11305
Earth cable (to connect any product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 310 10671
wristband tester	4822 344 13999

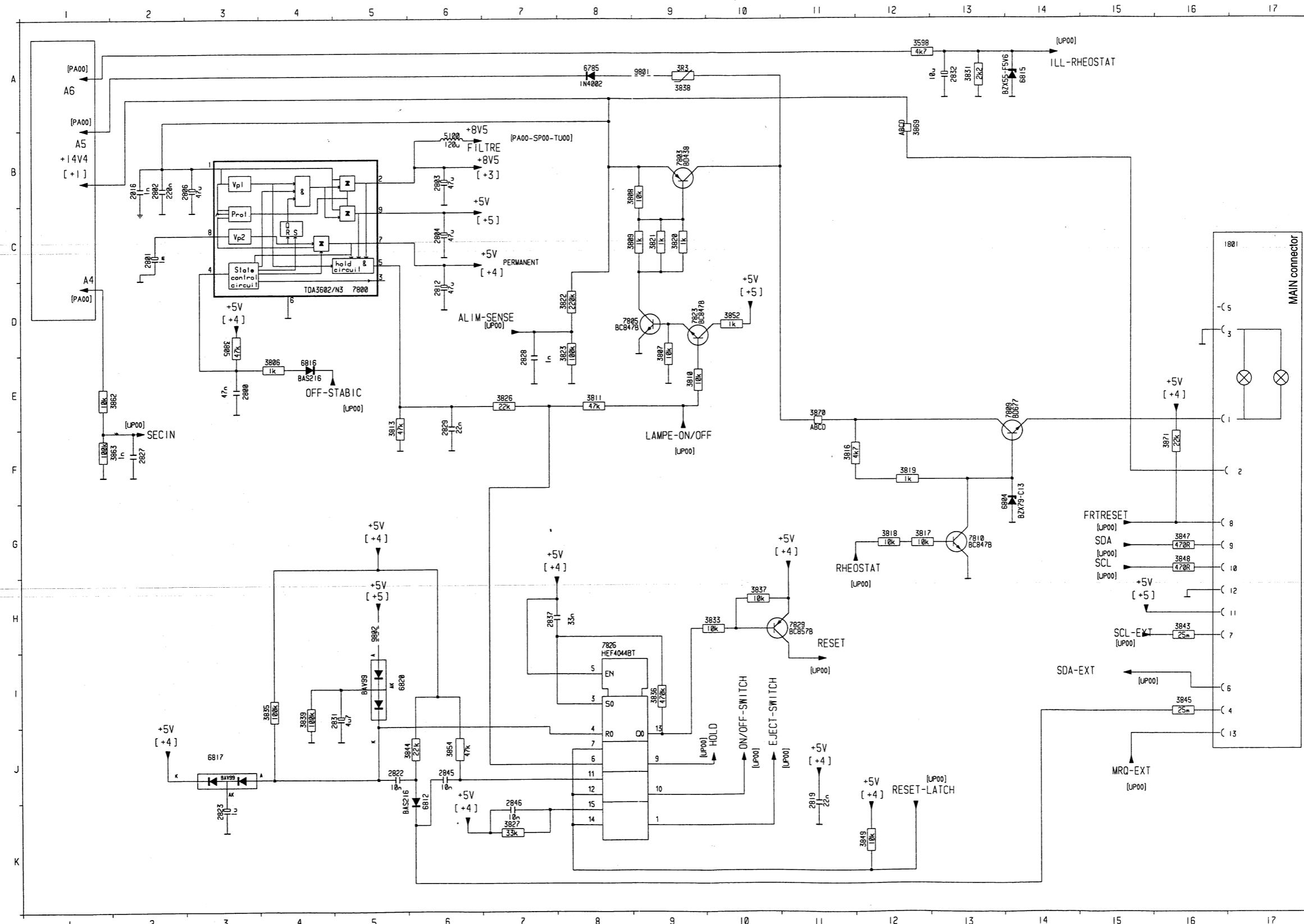






**POWER SUPPLY PART**  
**22DC593/62E**  
**22DC594/62E../62S**

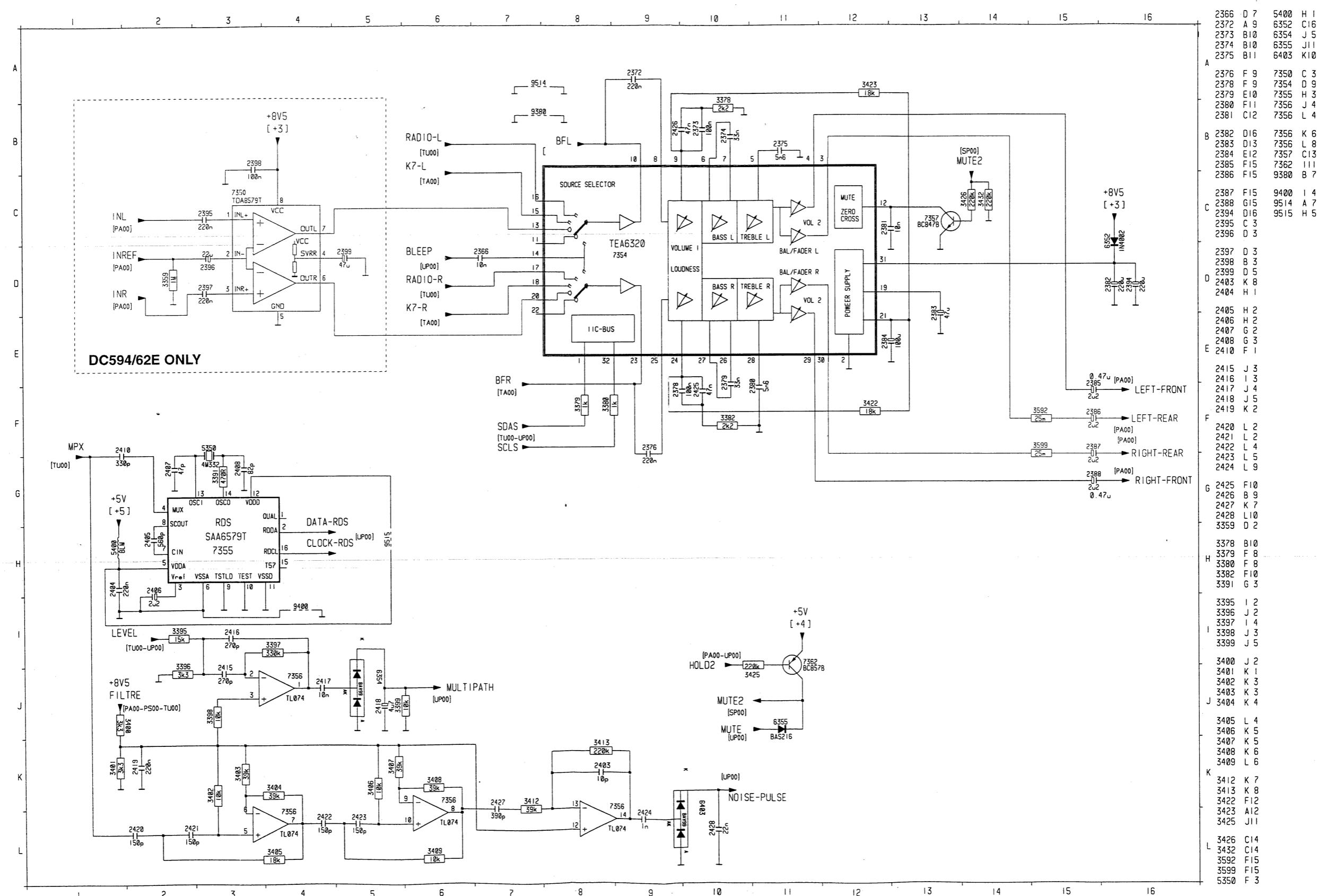
A4 .....	D1	FRTRESET .....	G15	ON/OFF-SWITCH .....	J10	SDA .....	G15
A5 .....	A1	HOLD .....	J10	RESET .....	I11	SDA-EXT .....	I15
A6 .....	A1	ILL-RHEOSTAT .....	A14	RESET-LATCH .....	J12	SECIN .....	F2
ALIM-SENSE .....	D7	LAMPE-ON/OFF .....	E9	RHEOSTAT .....	G11		
EJECT-SWITCH .....	J10	MRQ-EXT .....	J15	SCL .....	G15		
FILTRE .....	B6	OFF-STABIC .....	E4	SCL-EXT .....	H15		



1801	I16	7809	E14
2016	B2	7810	G13
2800	E3	7823	D9
2801	C2	7826	H8
2802	B2	7829	H11
A			
2803	B6	9801	A9
2804	C6	9802	H5
2806	B3		
2812	D6		
2819	J11		
B			
2822	J5		
2823	K3		
2827	F2		
2828	E7		
2829	E6		
C			
2831	I5		
2832	A13		
2837	H7		
2845	J6		
2846	K7		
D			
3598	A12		
3805	D3		
3806	E4		
3807	D9		
3808	B9		
E			
3809	C9		
3810	E8		
3811	E5		
3816	F11		
F			
3817	G12		
3818	G12		
3819	F12		
3820	C9		
3821	C9		
G			
3822	D8		
3823	D8		
3826	E7		
3827	K7		
3831	A13		
H			
3833	H10		
3835	I4		
G			
3836	I9		
3837	H10		
3838	A9		
I			
3839	I4		
3843	H16		
3844	J6		
H			
3845	I16		
3847	G16		
J			
3848	G16		
3849	K12		
3852	D10		
3854	J6		
3862	E1		
K			
3863	F1		
3865	A12		
3870	E11		
3871	F16		
5100	B6		
J			
6785	A8		
6804	G14		
6812	J6		
6815	A14		
6816	E4		
6817	J3		
6820	I5		
7800	D5		
7803	B9		
7805	D9		

**SOUND PROCESSING PART**  
**22DC593/62E**  
**22DC594/62E./62S**

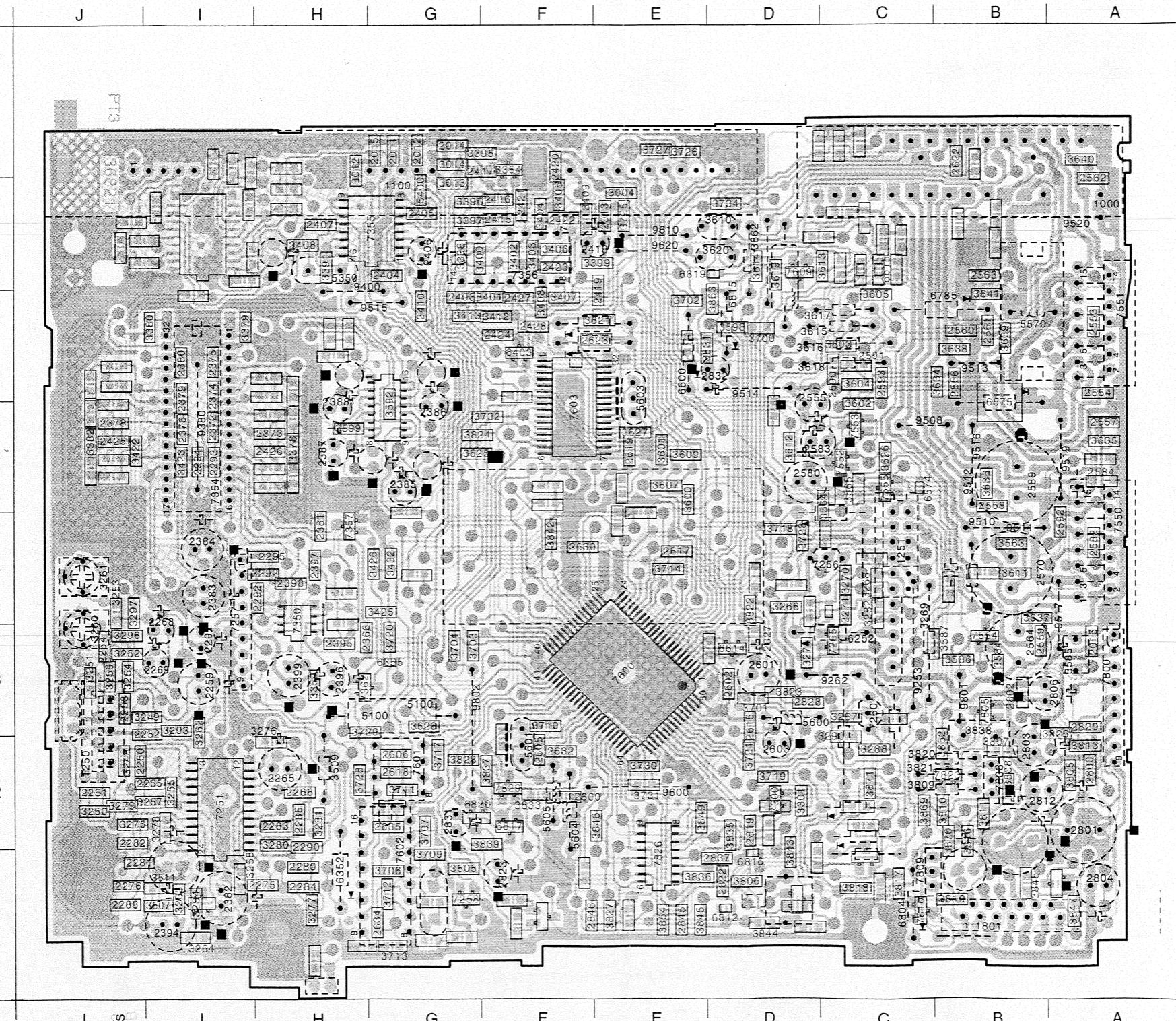
BFL.....	.B7	DATA-RDS.....	H4	LEFT-REAR.....	F15	NOISE-PULSE .....	K10
BFR.....	E6	HOLD2.....	J11	LEVEL .....	I2	RADIO-L.....	B5
BEEP.....	D5	INL.....	C1	MPX.....	F1	RADIO-R.....	D5
CASS-L.....	C5	INR .....	D1	MULTIPATH.....	J6	RIGHT-FRONT.....	F15
CASS-R.....	D5	INREF .....	D1	MUTE.....	J12	RIGHT-REAR.....	G15
CLOCK-RDS .....	H4	LEFT-FRONT .....	E15	MUTE2.....	J12/C13	SCLS.....	F6



1000 A 8	2269 I 4	2388 H 6	2570 B 4	2804 A 2	3269 C 4	3620 D 7	5570 B 7	6352 H 2	7354 I 6	7809 C 2	9512 B 5	9600 E 2
1100 G 8	2291 I 4	2394 I 1	2580 D 5	2806 B 3	3509 H 3	3809 B 2	5600 D 3	6600 E 6	7356 F 7	9253 C 4	9513 B 6	9610 E 7
1250 J 3	2382 I 2	2396 H 3	2583 D 6	2812 B 2	3585 A 4	3820 B 3	5601 F 3	6785 B 7	7550 A 5	9262 C 3	9514 D 6	9620 E 7
1251 C 4	2383 I 4	2399 H 3	2589 B 5	2823 F 2	3610 D 7	3821 B 3	5603 E 6	6804 C 1	7551 A 7	9380 I 6	9515 G 7	9801 B 3
1801 B 1	2384 I 5	2406 G 7	2601 D 3	2831 G 2	3615 C 7	3838 B 3	5604 F 2	6815 D 7	7601 G 3	9400 H 7	9516 B 5	9802 G 3
2259 I 3	2385 G 5	2418 E 7	2603 D 3	2832 D 6	3616 C 6	3862 D 7	5605 F 2	7256 C 5	7602 G 2	9508 C 6	9517 A 4	
2265 H 3	2386 G 6	2555 D 6	2801 A 2	3260 J 4	3617 C 7	5100 G 3	5606 F 6	7257 I 4	7800 A 3	9510 B 5	9519 A 5	
2268 I 4	2387 H 5	2564 B 4	2803 B 3	3261 J 4	3618 C 6	5350 H 7	6252 C 4	7260 C 3	7803 B 3	9511 B 5	9520 B 8	

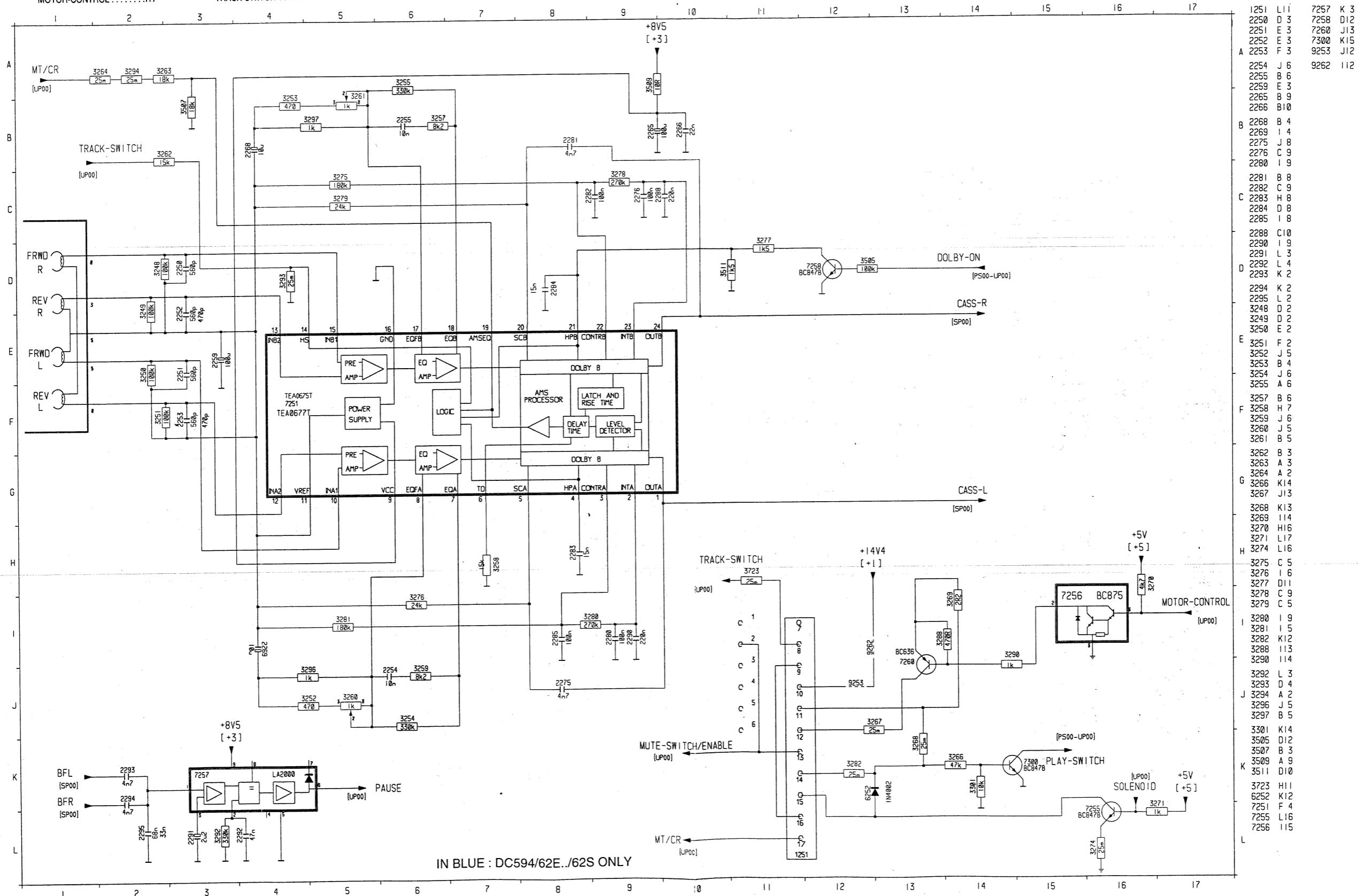
**22DC593/62E  
22DC594/62E  
22DC594/62S**

2011 G 8	2605 F 3	3404 F 8	3734 D 8
2012 G 8	2606 G 3	3405 F 8	3805 A 3
2013 E 8	2615 D 3	3406 F 7	3806 D 2
2014 G 8	2617 E 5	3407 F 7	3807 B 3
2015 G 8	2618 G 3	3408 F 7	3808 B 2

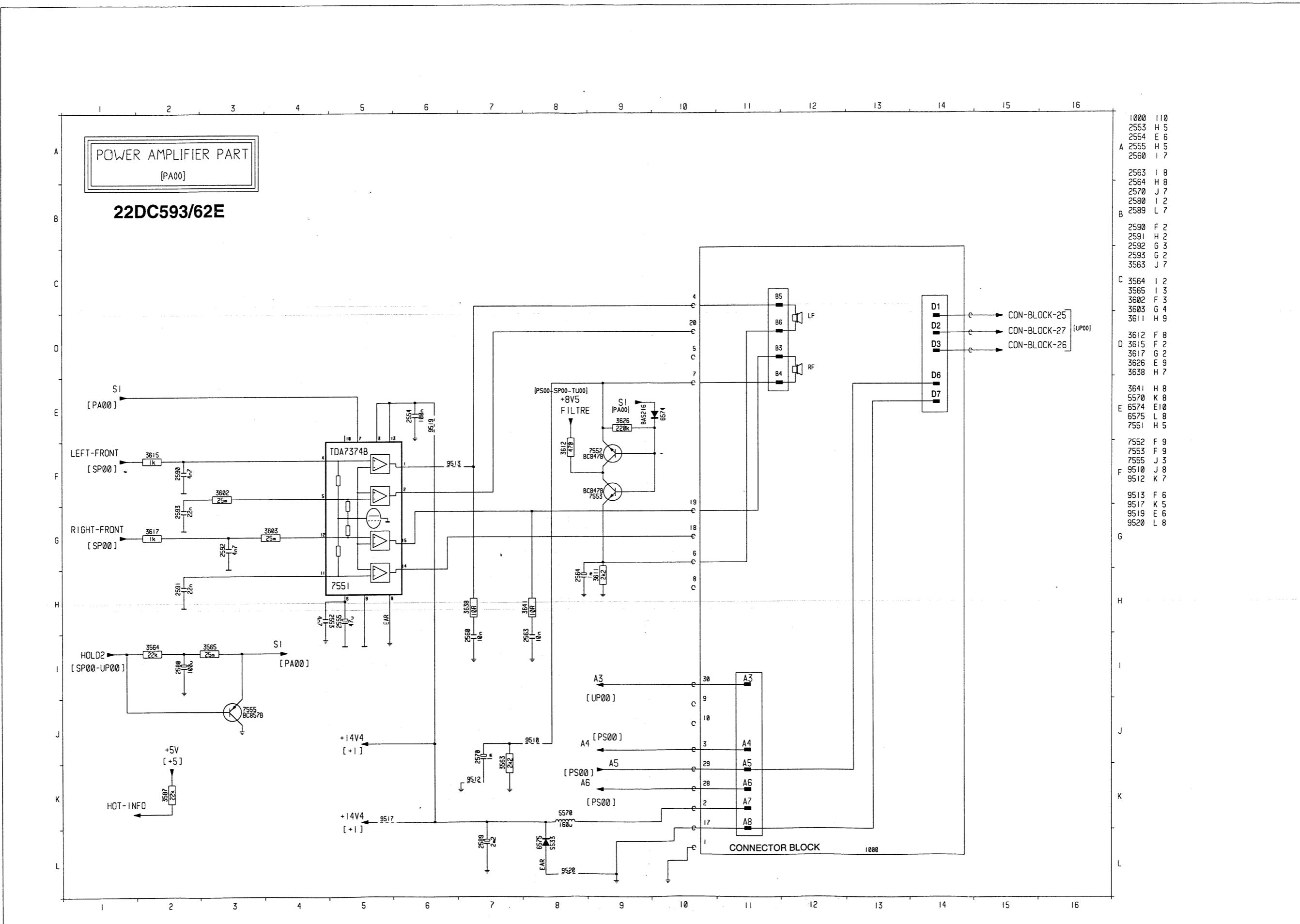


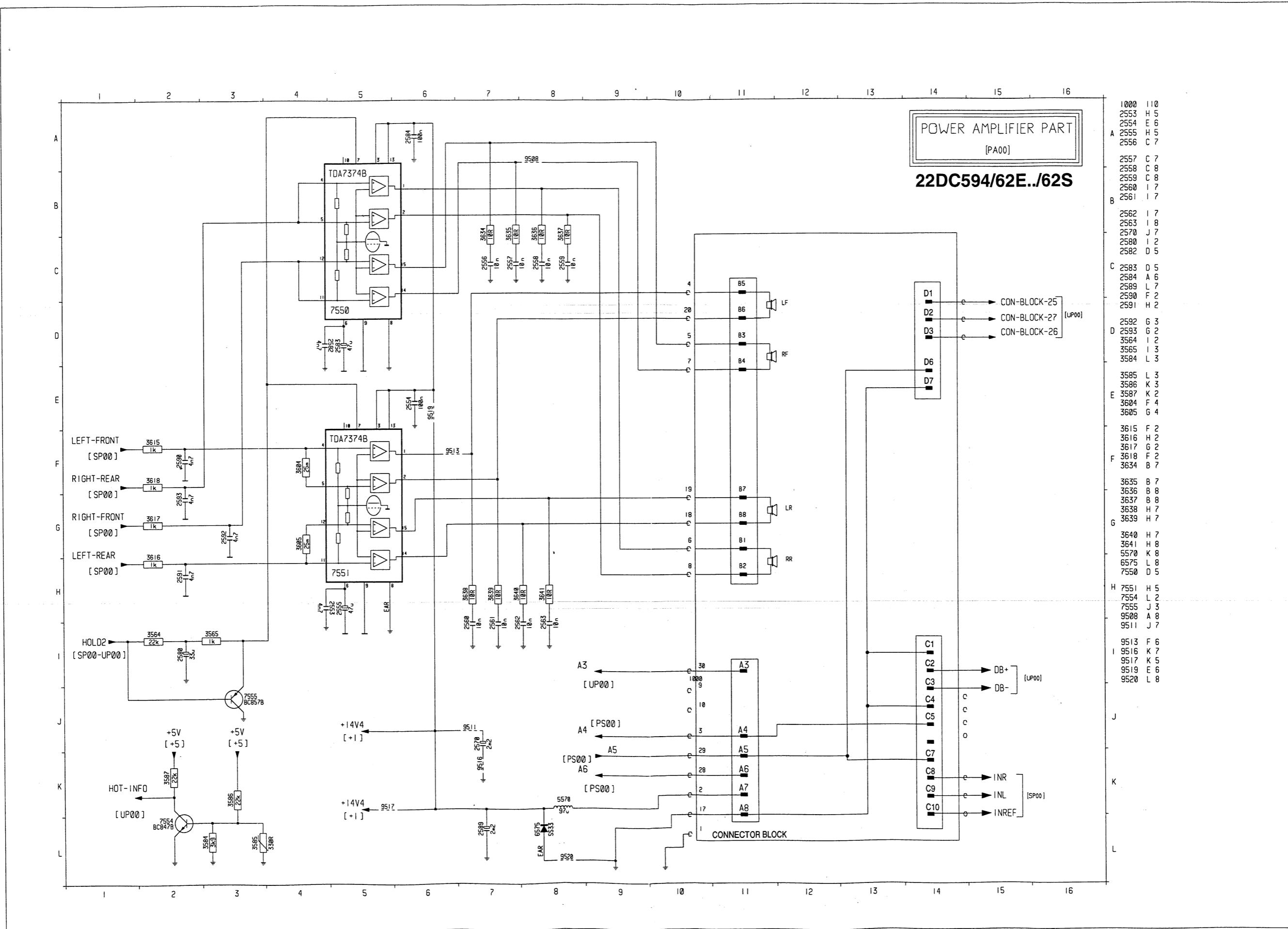
**TAPE PART**  
**22DC593/62E**  
**22DC594/62E../62S**

BFL.....K1	MT/CR.....A1/L10
BFR.....K1	MUTE-SWITCH/ENABLE...K10
CASS-L.....G17	PAUSE.....K5
CASS-R.....E17	PLAY-SWITCH.....J15
DOLBY-ON.....D15	SOLENOID.....K15
MOTOR-CONTROL.....I17	TRACK-SWITCH.....H10

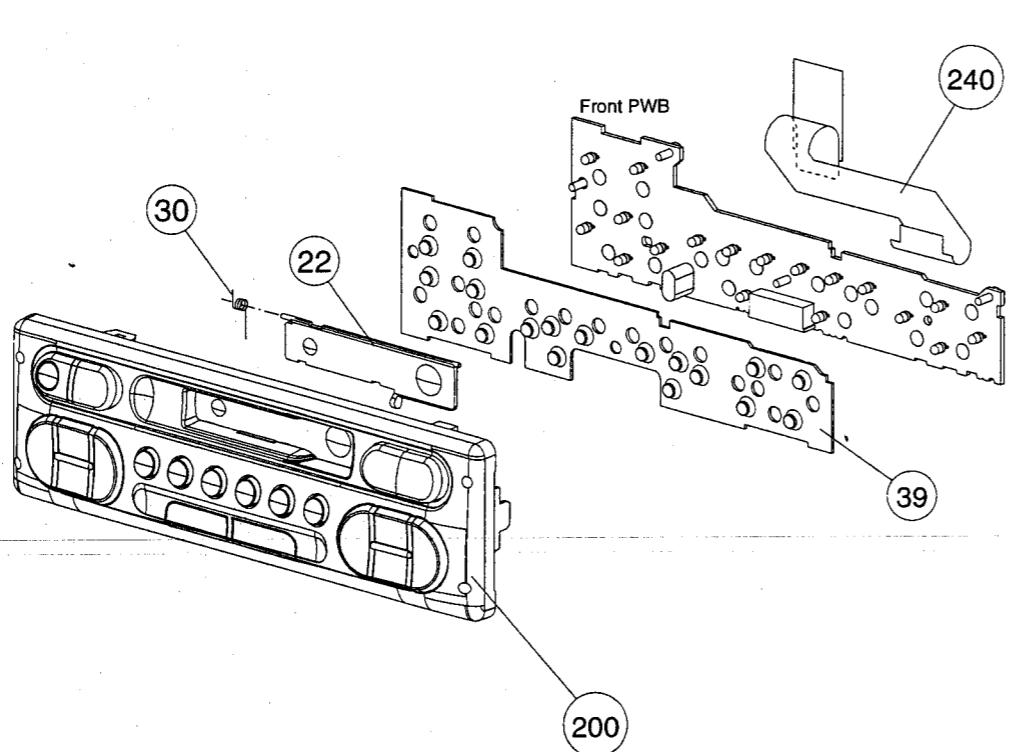


IN BLUE : DC594/62E../62S ONLY

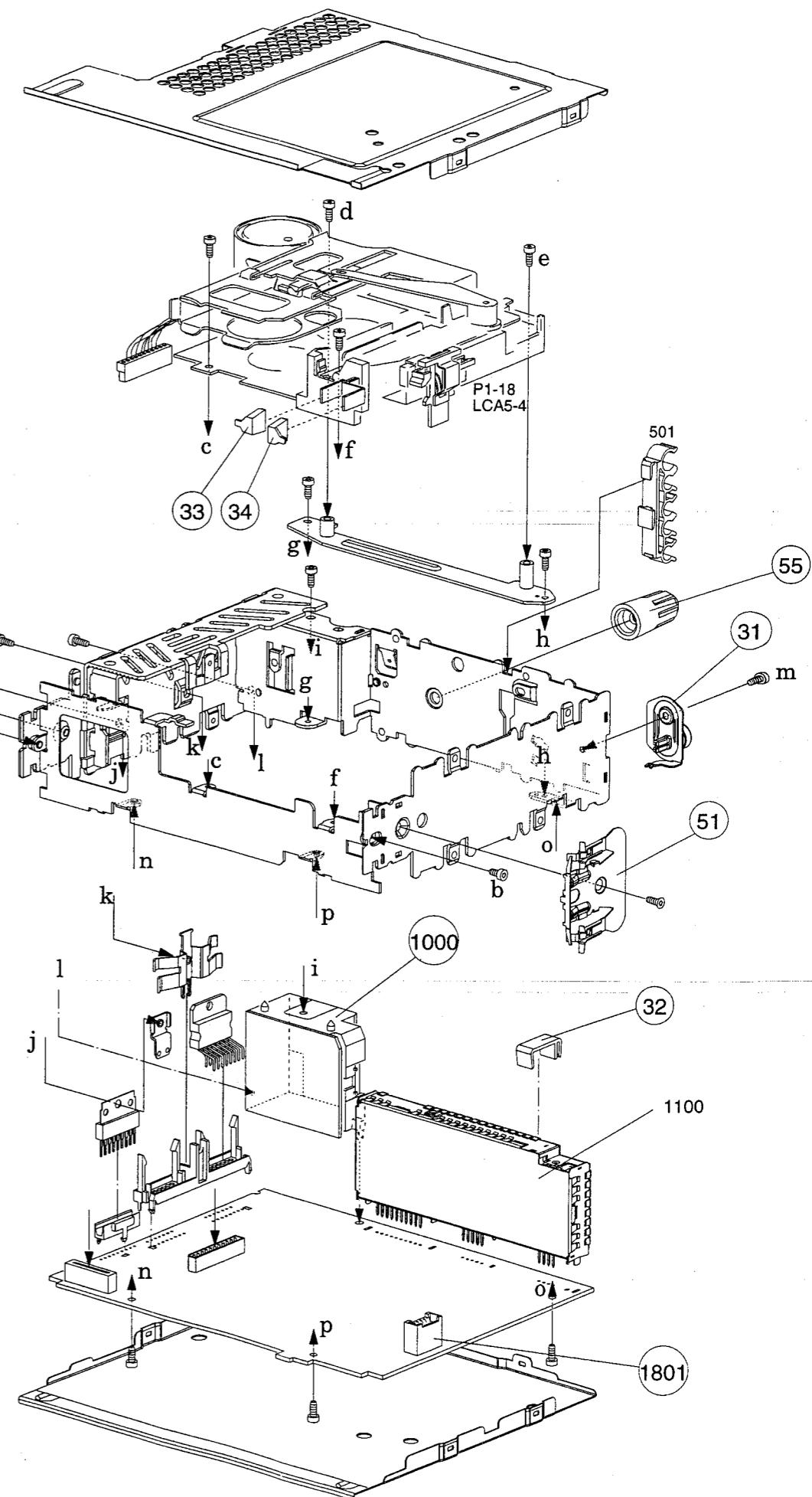




**22DC594/62E../62S**  
**22DC593/62E**



22	4822 443 10388	FLAP CASSETTE FOR DC594/62E	55	4822 532 12177	SPACER
22	4822 443 10389	FLAP CASSETTE FOR DC594/62S	200	4822 459 04265	PLATE ORNAMENTAL DC593/62E
22	4822 443 10417	FLAP CASSETTE FOR DC593/62E	200	4822 459 04246	PLATE ORNAMENTAL DC594/62E
30	4822 492 42231	FLAP SPRING	200	4822 459 04247	PLATE ORNAMENTAL DC594/62S
31	4822 26731702	AERIAL BUSH ASSY	240	4822 320 11527	FLEX FOIL
32	4822 404 21276	HOOK IC91	1000	4822 265 10663	CONNECTOR BLOCK DC593/62E
33 - 34	4822 402 10412	BRACKET BUTTONS DECK	1000	4822 265 10613	CONNECTOR BLOCK DC594/62E
39	4822 410 10605	KEYPAD	1000	4822 265 10321	CONNECTOR BLOCK DC594/62S
51 - 52	4822 492 72124	MOUNTING SPRING	1801	4822 265 41348	CONNECTOR HEAD DECK



Miscellaneous			
1100	4822 210 10705	MODULE TUNER IC91	
2011	5322 122 34098	10nF 10% X7R 63V	2396 4822 124 23279 22μF 20% 16V
2012	5322 122 34098	10nF 10% X7R 63V	2397 4822 126 13849 220nF 10% 16V X7R 0805
2013	5322 126 10223	4,7nF 10% X7R 63V	2398 4822 126 13196 100nF 10% X7R 25V
2014	5322 126 10223	4,7nF 10% X7R 63V	2399 4822 124 22646 47μF 20% 16V
2015	5322 122 34123	1nF 10% X7R 50V	2403 5322 122 32448 10pF 5% 50V
2016	5322 122 34123	1nF 10% X7R 50V	2404 4822 126 13849 220nF 10% 16V X7R 0805
2250	5322 116 80853	560pF 5% 50V NP0 0805	2405 5322 116 80853 560pF 5% NP0 63V
2251	5322 116 80853	560pF 5% 50V NP0 0805	2406 4822 124 23504 2,2μF 20% 50V
2252*	5322 116 80853	560pF 5% 50V NP0 0805	2407 5322 122 32452 47pF 5% NP0 63V
2252*	5322 122 32268	470pF 5% 50V NP0 0805	2408 4822 122 33515 82pF 5% NP0 63V
2253*	5322 116 80853	560pF 5% 50V NP0 0805	2410 5322 122 31863 330pF 5% NP0 50V
2253*	5322 122 32268	470pF 5% 50V NP0 0805	2415 4822 122 33216 270pF 50V NP0 0805
2254	5322 122 34098	10nF 10% X7R 63V	2416 4822 122 33216 270pF 50V NP0 0805
2255	5322 122 34098	10nF 10% X7R 63V	2417 5322 122 34098 10nF 10% X7R 63V
2259	4822 124 80453	100μF 20% 10V	2418 4822 124 80765 4,7μF 20% 35V
2265	4822 124 80453	100μF 20% 10V	2419 4822 126 13849 220nF 10% 16V X7R 0805
2266	5322 122 32654	22nF 10% X7R 63V	2420 5322 122 33538 150pF 2% NP0 63V
2268	4822 124 41017	10μF 16V	2421 5322 122 33538 150pF 2% NP0 63V
2269	4822 124 41017	10μF 16V	2422 5322 122 33538 150pF 2% NP0 63V
2275	5322 126 10223	4,7nF 10% X7R 63V	2423 5322 122 33538 150pF 2% NP0 63V
2276	4822 126 13196	100nF 10% X7R 25V	2427 4822 122 32636 390pF 5% SL 50V
2280	4822 126 13196	100nF 10% X7R 25V	2428 5322 122 32654 22nF 10% X7R 63V
2281	5322 126 10223	4,7nF 10% X7R 63V	2553 5322 126 10223 4,7nF 10% X7R 63V
2282	4822 126 13196	100nF 10% X7R 25V	2554 4822 122 33496 100nF 10% X7R 63V
2283	4822 126 13188	15nF 5% X7R 63V	2555 5322 124 41938 47μF 6V3
2284	4822 126 13188	15nF 5% X7R 63V	2556 5322 122 34098 10nF 10% X7R 0805
2285	4822 126 13196	100nF 10% X7R 25V	2557 5322 122 34098 10nF 10% X7R 0805
2288	4822 126 13849	220nF 10% 16V X7R 0805	2558 5322 122 34098 10nF 10% X7R 0805
2290	4822 126 13849	220nF 10% 16V X7R 0805	2559 5322 122 34098 10nF 10% X7R 0805
2291	4822 124 23504	2,2μF 20% 50V	2560 5322 122 34098 10nF 10% X7R 0805
2292	4822 126 13343	47nF 10% X7R 25V	2561 5322 122 34098 10nF 10% X7R 0805
2293	5322 126 10223	4,7nF 10% X7R 63V	2562 5322 122 34098 10nF 10% X7R 0805
2294	5322 126 10223	4,7nF 10% X7R 63V	2563 5322 122 34098 10nF 10% X7R 0805
2295*	4822 122 33342	33nF 10% X7R 50V 0805	2564 4822 124 80766 1000uF 20% 25V
2295*	4822 126 13392	68nF 10% X7R 0805	2570* 4822 124 80766 1000uF 20% 25V
2366	5322 122 34098	10nF 10% X7R 63V	2570* 4822 124 80769 2200μF 20% 16V
2372	4822 126 13849	220nF 10% 16V X7R 0805	2580* 4822 124 80453 100μF 20% 10V
2373	4822 126 13196	100nF 10% X7R 25V	
2374	4822 122 33342	33nF 10% X7R 63V	2580* 4822 124 23281 33μF 20% 16V
2375	4822 122 32646	5,6nF 10% X7R 50V	2582 5322 126 10223 4nF7 10% 50V X7R 0805
2376	4822 126 13849	220nF 10% 16V X7R 0805	2583 5322 124 41938 47μF 20% 6V3
2378	4822 126 13196	100nF 10% X7R 25V	2584 4822 122 33496 100nF 10% 50V X7R 1206
2379	4822 122 33342	33nF 10% X7R 63V	2589 4822 124 80769 2200μF 20% 16V
2380	4822 122 32646	5,6nF 10% X7R 50V	
2381	5322 122 34098	10nF 10% X7R 63V	2590 5322 126 10223 4,7nF 10% X7R 63V
2382	4822 124 23582	220μF 10V	2591* 5322 122 32654 22nF 10% X7R 63V
2383	4822 124 22646	47μF 20% 16V	2592 5322 126 10223 4,7nF 10% X7R 63V
2384	4822 124 80453	100μF 20% 10V	2593* 5322 122 32654 22nF 10% X7R 63V
2385*	4822 124 40999	470nF 20% 50V	2593* 5322 126 10223 4,7nF 10% X7R 63V
2385*	4822 124 23504	2,2μF 20% 50V	2600 5322 122 32654 22nF 10% X7R 63V
2386	4822 124 23504	2,2μF 20% 50V	2601 4822 124 22646 47μF 20% 16V
2387	4822 124 23504	2,2μF 20% 50V	2602 4822 126 13196 100nF 10% X7R 25V
2388*	4822 124 40999	470nF 20% 50V	2603 4822 124 41017 10μF 16V
2388*	4822 124 23504	2,2μF 20% 50V	2605 5322 122 32658 22pF 5% 50V
2394	4822 124 23582	220μF 10V	2606 4822 126 13196 100nF 10% X7R 25V
2395	4822 126 13849	220nF 10% 16V X7R 0805	2615 4822 122 33342 33nF 10% X7R 63V
			2617 4822 122 33342 33nF 10% X7R 63V
			2618 5322 122 32654 22nF 10% X7R 63V

2619	4822 126 13196	100nF 10% X7R 25V	3281 4822 051 20184 180KΩ 5% 0,1W
2622	5322 122 34123	1nF 10% X7R 50V	3282 4822 051 20008 CHIP JUMPER MAX 0R05
2623	4822 126 13196	100nF 10% X7R 25V	3288 4822 051 20471 470Ω 5% 0,1W
2630	5322 122 34123	1nF 10% X7R 50V	3290 4822 051 20102 1KΩ 5% 0,1W
2632	5322 122 32268	470pF 10% 50V	3292 4822 051 20334 330KΩ 5% 0,1W
2634	5322 122 32531	100pF 5% NP0 50V	3293 4822 051 20008 CHIP JUMPER MAX 0R05
2635	5322 126 10223	4,7nF 10% X7R 63V	3294 4822 051 20008 CHIP JUMPER MAX 0R05
2800	4822 126 13343	47nF 10% X7R 25V	3296 4822 051 20102 1KΩ 5% 0,1W
2801	4822 124 80766	1000μF 20% 25V	3297 4822 051 20102 1KΩ 5% 0,1W
2802	4822 126 13849	220nF 10% 16V X7R 0805	3301 4822 117 10833 10KΩ 5% 0805 RC11
2803	4822 124 22646	47μF 20% 16V	3359 4822 051 20105 1MΩ 5% RC11 0805
2804	4822 124 22646	47μF 20% 16V	3378 4822 117 11449 2K2 1% 0,1W
2806	4822 124 11562	47μF 20% 35V	3379 4822 051 20102 1KΩ 5% 0,1W
2812	4822 124 22646	47μF 20% 16V	3380 4822 051 20102 1KΩ 5% 0,1W
2819	5322 122 32654	22nF 10% X7R 63V	3382 4822 117 11449 2K2 1% 0,1W
2822	5322 122 34098	10nF 10% X7R 63V	3391 4822 051 20471 470Ω 5% 0,1W
2823	4822 124 23282	1μF 20% 50V	3395 4822 051 20153 15KΩ 5% RC11 0805
2827	5322 122 34123	1nF 10% X7R 50V	3396 4822 051 20332 3K3 5% RC11 0805
2828	5322 122 34123	1nF 10% X7R 50V	3397 4822 051 20334 330KΩ 5% RC11 0805
2829	5322 122 32654	22nF 10% X7R 63V	3398 4822 117 10833 10KΩ 1% 0,1W
			3403 4822 051 20393 39KΩ 5% 0,1W
3004	4822 051 20223	22KΩ 5% RC11 0805	3404 4822 051 20393 39KΩ 5% 0,1W
3012	4822 051 20102	1KΩ 5% 0,1W	3405 4822 051 20

3609	4822 051 20008	0Ω JUMP. (0805)	3816	4822 051 20472	4K70 5% 0,1W
3610	4822 116 40221	R PTC 8Ω2	3817	4822 117 10833	10KΩ 1% 0,1W
3611	4822 051 20222	2K2 5% 0,1W	3818	4822 117 10833	10KΩ 1% 0,1W
3612	4822 051 20471	470Ω 5% 0,1W	3819	4822 051 20102	1KΩ 5% 0,1W
3613	4822 051 20333	33KΩ 5% 0,1W	3820	4822 116 83863	1KΩ 5% 0,5W
3614	4822 051 20104	100KΩ 5% 0,1W	3821	4822 116 83863	1KΩ 5% 0,5W
3615	4822 116 83863	1KΩ 5% 0,5W	3822	4822 051 20224	220KΩ 5% 0,1W
3616	4822 116 83863	1KΩ 5% 0,5W	3823	4822 051 20104	100KΩ 5% 0,1W
3617	4822 116 83863	1KΩ 5% 0,5W	3824	4822 117 10833	10KΩ 1% 0,1W
3618	4822 116 83863	1KΩ 5% 0,5W	3825	4822 117 10833	10KΩ 1% 0,1W
3619	4822 117 11449	2K2 1% 0,1W	3826	4822 051 20223	22KΩ 5% 0,1W
3620	4822 116 40221	R PTC 8Ω2	3827	4822 051 20333	33KΩ 5% 0,1W
3621	4822 051 20101	100Ω 5% 0,1W	3828	4822 117 10833	10KΩ 1% 0,1W
3626	4822 051 20224	220KΩ 5% 0,1W	3831	4822 117 11449	2K2 1% 0,1W
3627	4822 051 20102	1KΩ 5% 0,1W	3833	4822 117 10833	10KΩ 1% 0,1W
3628	4822 051 20008	0Ω JUMP. (0805)	3835	4822 051 20104	100KΩ 5% 0,1W
3634	4822 051 20109	10Ω 5% 0805 B/T	3836	4822 051 20474	470KΩ 5% 0,1W
3635	4822 051 20109	10Ω 5% 0805 B/T	3837	4822 117 10833	10KΩ 1% 0,1W
3636	4822 051 20109	10Ω 5% 0805 B/T	3838	4822 116 40267	3R3 25% 20V
3637	4822 051 20109	10Ω 5% 0805 B/T	3839	4822 051 20104	100KΩ 5% 0,1W
3638	4822 051 20109	10Ω 5% 0805 B/T	3842	4822 117 10833	10KΩ 1% 0,1W
3639	4822 051 20109	10Ω 5% 0805 B/T	3843	4822 051 20008	0R05 JUMPER 0805
3640	4822 051 20109	10Ω 5% 0805 B/T	3844	4822 051 20223	22KΩ 5% 0805 RC11
3641	4822 051 20109	10Ω 5% 0805 B/T	3845	4822 051 20008	CHIP JUMPER MAX 0R05
3700	4822 117 10833	10KΩ 1% 0,1W	3846	4822 051 20102	1KΩ 5% 0,1W
3701	4822 051 20101	100Ω 5% 0,1W	3847	4822 051 20471	470Ω 5% 0,1W
3702	4822 051 20331	330Ω 5% RC11 0805^M	3848	4822 051 20471	470Ω 5% 0,1W
3703	4822 117 10833	10KΩ 1% 0,1W	3849	4822 117 10833	10K 1% 0,1W
3704	4822 117 10833	10KΩ 1% 0,1W	3852	4822 051 20102	1KΩ 5% 0,1W
3706	4822 051 20008	0Ω JUMP. (0805)	3854	4822 051 20473	47KΩ 5% 0,1W
3707	4822 051 20008	0Ω JUMP. (0805)	3860	4822 051 20104	100KΩ 5% 0,1W
3709	4822 051 20153	15KΩ 5% 0,1W	3862	4822 116 83864	10K 5% CPB R-20
3710	4822 051 20471	470Ω 5% 0,1W	3863	4822 051 20104	100KΩ 5% 0,1W
3711	4822 051 20153	15KΩ 5% 0,1W	3869	4822 051 20008	0Ω JUMP. 0805)
3712	4822 051 20008	0Ω JUMP. (0805)	3870	4822 051 20008	0Ω JUMP. 0805)
3713	4822 051 20473	47KΩ 5% 0,1W	3871	4822 051 20223	22K 5% RC11 O 805
3714	4822 051 20473	47KΩ 5% 0,1W			
3717	4822 117 10833	10KΩ 1% 0,1W			
3718	4822 051 20472	4K70 5% 0,1W			
3719	4822 051 20153	15KΩ 5% 0805 RC11			
3720	4822 051 20102	1KΩ 5% 0,1W	5100	4822 157 71433	120μH 10% LAL_05TB121K
3721	4822 051 20153	15KΩ 5% 0,1W	5350	4822 242 80259	LN-G38-31 (4, 332MHZ)
3723	4822 051 20008	0R05 JUMPER 0805	5400	4822 157 71206	BLM21A10PT
3725	4822 051 20104	100KΩ 5% 0,1W	5570*	4822 157 70935	97μH 10A
3726	4822 051 20101	100Ω 5% 0,1W	5570*	4822 157 70839	160μH 5A
3727	4822 051 20101	100Ω 5% 0,1W	5600	4822 157 52983	22μH 10%
3728	4822 117 10833	10KΩ 1% 0,1W	5601	4822 242 81959	CST11.5MW
3729	4822 117 10833	10KΩ 1% 0,1W	5603	4822 242 81002	CST6.00MGW
3730	4822 051 20153	15KΩ 5% 0,1W	5604	4822 157 60122	LAL02 4,7H 5%
3731	4822 051 20473	47KΩ 5% 0,1W	5605	4822 157 60122	LAL02 4,7H 5%
3732	4822 051 20102	1KΩ 5% 0,1W	5606	4822 157 71206	IND SM 10MH z 600R
3734	4822 051 20153	15KΩ 5% RC11 0805			
3805	4822 051 20473	47KΩ 5% 0,1W	6252	5322 130 30684	DIODE 1N002 GPE
3806	4822 051 20102	1KΩ 5% 0,1W	6352	5322 130 30684	DIODE 1N002 GPE
3807	4822 117 10833	10KΩ 1% 0,1W	6354	5322 130 34337	BAV99
3808	4822 117 10833	10KΩ 1% 0,1W	6355	4822 130 83757	DIODE BA216
3809	4822 116 83863	1KΩ 5% 0,5W	6403	5322 130 34337	BAV99
3810	4822 117 10833	10KΩ 1% 0,1W	6574	4822 130 83757	DIODE BA216
3811	4822 051 20473	47KΩ 5% 0,1W	6575	4822 130 10488	SM DIOD
3813	4822 051 20473	47KΩ 5% 0,1W	6600	4822 130 34173	ZENER BZ55-F5V6
			6614	5322 130 34331	BAV70

6615      4822 130 83757      DIODE BAS216	
6785      5322 130 30684      1N4002GPE	
6804      4822 130 34195      BZX79-C13	
6610      4822 130 32904      BZV85-C5V6	
6611      4822 130 32904      BZV85-C5V6	
6812      4822 130 83757      DIODE BAS216	
6815      4822 130 34173      BZX55-F5V6	
6816      4822 130 83757      DIODE BAS216	
6817      5322 130 34337      BAV99	
6818      5322 130 34331      BAV70	
6819      4822 130 83757      DIODE BAS216	
6820      5322 130 34337      BAV99	
7251*      4822 209 33237      TEA9677T/V1	
7251*      4822 209 32744      TEA0675T/V1	
7255      4822 130 60511      BC847B	
7256      5322 130 61677      BC875	
7257      4822 209 83159      LA2000	
7258      4822 130 60511      BC847B	
7260      4822 130 44283      BC636	
7300      4822 130 60511      SM TRANS BC847B	
7350      4822 209 33985      TDA8579T/N1	
7354      4822 209 32745      TEA6320/V1	
7355      4822 209 31981      SAA6579T/V1	
7356      4822 209 32742      TL074IN	
7357      4822 130 60511      BC847B	
7362      5322 130 60508      BC857B	
7550      4822 209 90404      TDA7374B POWER IC	
7551      4822 209 31132      TDA7374V TILL FD01	
7551      4822 209 90404      TDA7374B FROM FD02	
7552      4822 130 60511      BC847B	
7553      4822 130 60511      BC847B	
7554      4822 130 60511      BC847B	
7555      5322 130 60508      BC857B	
7600      4822 209 13705      P83CE558EFB/ 82	
7602      5322 209 10468      HEF4521BP	
7603      4822 209 32743      MSM6307GS-VK	
7609      4822 130 60511      BC847B	
7800      4822 209 33029      TDA3602/N3	
7803      4822 130 40995      BD438(141Y)	
7805      4822 130 60511      BC847B	
7809      4822 130 41484      BD677(142Y)	
7810      4822 130 60511      BC847B	
7823      4822 130 60511      BC847B	
7826      4822 209 12628      HEF4044BT	
7829      5322 130 60508      BC857B	

Items with \*: Alternative components. See schematic diagrams

Service  
Service  
Service



PHIL-04728



# Service Manual

12 V

## TECHNICAL DATA

Operating voltage	: 9 - 16V (nom. 13.2V)
Tape speed	: 4.76cm/sec ± 0.5%
Wow & flutter	: ≤ 0.35% RMS (+10 - +45°C)
Crosstalk (track 2-3)	: < -40dB
Fast wind time	: ≤ 115secs (C-60)
Number of tracks	: 2x2
Channel separation (Tracks 1-2/3-4)	: > 35dB



PHILIPS

4728

## GENERAL

The LCA2.4 has the following features:

- Dolby
- "Key-Off" standby
- Automatic Music sensor System
- Metal / Ferro tape selector switch

## MAINTENANCE

The cassette mechanism requires periodic cleaning, as well as periodic lubrication of the principal points.

### 1. Cleaning with alcohol or spirit

- Playback head (pos.332).
- Pressure rollers & capstans (pos.17, 57 and 58).
- Belt (pos.207) & pulley (pos.39).

To clean head, pressure roller and capstan, it is also possible to use drop-in cassette SBC114 (4822 389 20035).

### 2. Lubrication

Refer to the 'Lubrication Overview' on page 5.

## ADJUSTMENTS AND CHECKS

Equipment required:

- Universal test cassette SBC419 (4822 397 30069)
- Universal test cassette SBC420 (4822 397 30071)
- Friction test cassette 811/CTM (4822 395 30054)
- Spring scale 50-500g (4822 395 80028)
- Puller for clutch (4822 395 60039)
- Wow & flutter meter
- AC millivoltmeters
- Spring scale 50-500 g

### 1. Pressure roller pressure

The pressure on the capstans should be 210 - 370 grammes (2.1 - 3.7N).

This pressure is measured as follows (NOR and REV):

- Select Play mode.
- Push the pressure roller back at the shown point by means of the spring scale.
- At the point where pressure roller and capstan just disengage the spring scale should be read.
- If the pressure is incorrect, replace spring 19.

### 2. Friction clutch (Reel assy)

- Insert friction test cassette 811/CTM (NOR and REV).
- Play take-up torque should be 35 - 75g/cm.
- Fast wind torque should be 40 - 150g/cm.
- If the torque is not correct, replace reel assy.

### 3. Wow & flutter/tape speed (Fig. G)

This check is carried out on a complete car radio; proceed as follows:

- Connect the wow & flutter meter to the LS outputs.
- Insert test cassette SBC419 (or SBC420) and play the 3150Hz signal.
- The wow & flutter value should be  $\leq 0.35\%$ .
- Tape speed should be 4.76cm/sec.  $\pm 0.5\%$ .
- The tape speed can be adjusted with screw "S".

In case of an excessive wow & flutter value, check following parts for correct functioning:

- motor 320
- pressure (pinch) rollers 17
- belt 207
- friction clutches (reel assy's)
- flywheels 57 and 58
- pulley 39

### 4. Azimuth (Figs. G, H)

This check is carried out on a complete car radio; proceed as follows:

- Apply a  $4\Omega$  load to both loudspeaker outputs.
- Connect an AC millivoltmeter across both loudspeaker outputs.
- Play the 10kHz signal of test cassette SBC419 or SBC420.
- Adjust screw 'A' for the average of the max. output voltages.
- The maximum allowed difference between both channels is 4 dB.
- Switch over to 'reverse play'.
- If the value measured differs from the previously measured value, bearing 49 in the front flywheel ("reverse") should be displaced.

### 5. Flywheels 57, 58

Refer to Fig. J.

## **DISASSEMBLY INSTRUCTIONS**

### **Notes:**

In a few places parts are locked by synthetic bosses.  
To be able to dismantle these parts, the bosses have to  
be bent, displaced etc.  
Gearwheels 33 and 34 and pressure rollers 17 are  
attached to the spindles by means of a snap connection.  
These parts can be disassembled carefully with a  
screwdriver.  
If gearwheel 33 (or 34) has to be replaced, the  
corresponding bracket 12 (or 13) should ALSO be  
replaced.

### **Belt 207, Fly wheels 57 & 58, Cog wheel assy 12 & 33**

See figure A.

### **Pressure roller 17, Head assy 332**

See figure B.

### **Head bracket 298**

See figure C.

### **Clutch 6**

See figure D.

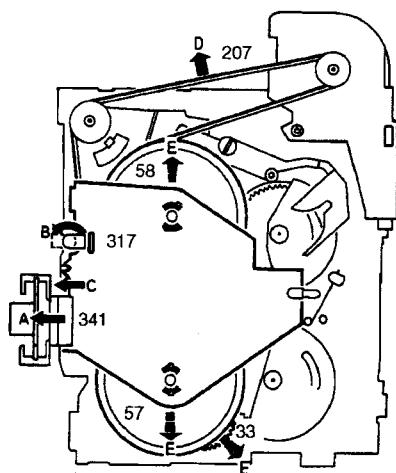
### **Cog wheels 30, 31, 34**

See figure E.

### **Reel base assy**

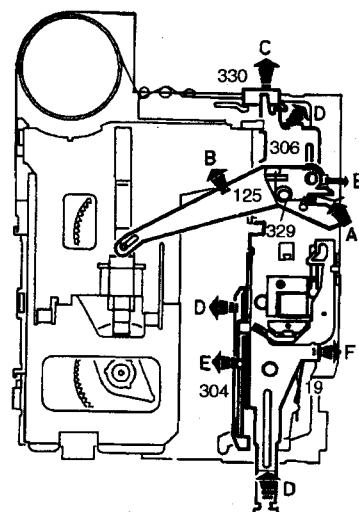
See figure F.

**BELT 207, FLY WHEELS 57 & 58, COG WHEEL ASSY 12,33**



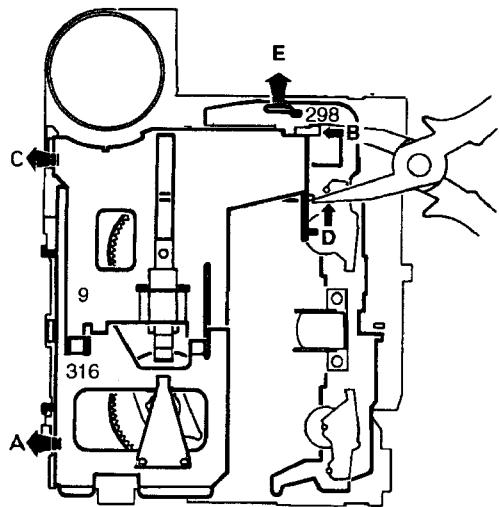
**Fig. A**

**PRESSURE ROLLER 17, HEAD 332**



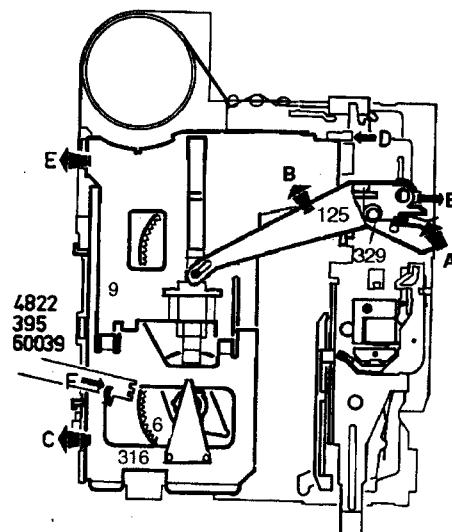
**Fig. B**

**HEAD BRACKET 298**



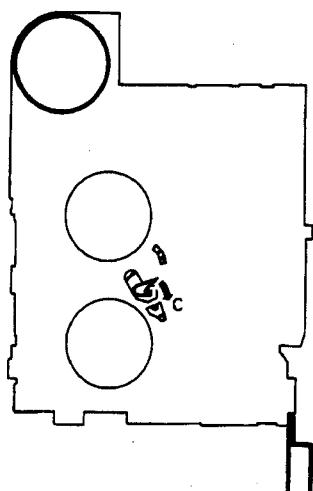
**Fig. C**

**CLUTCH 6**

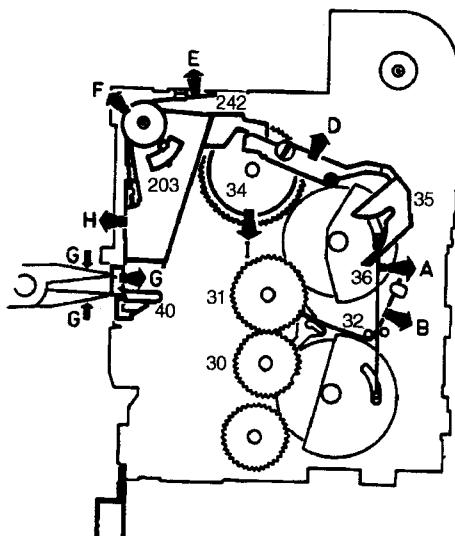


**Fig. D**

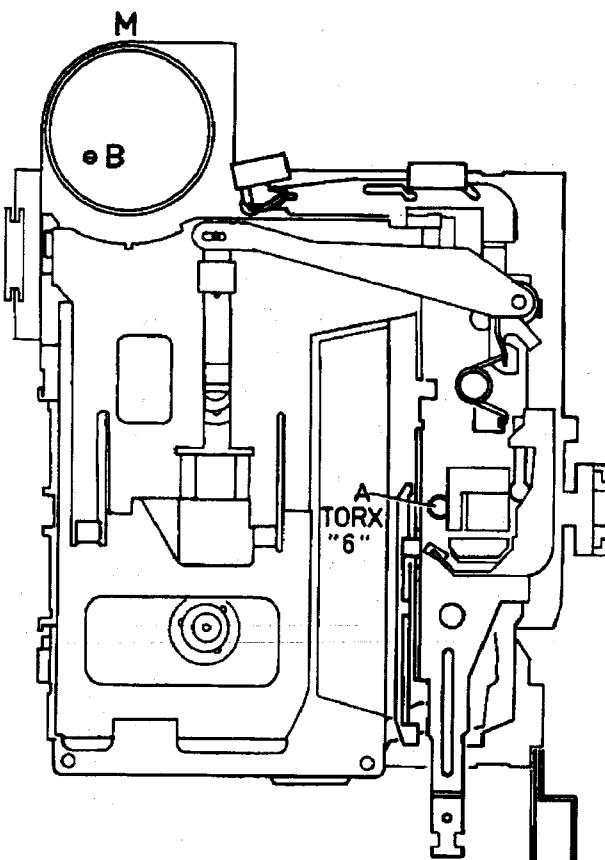
**COG WHEELS 30, 31, 34**



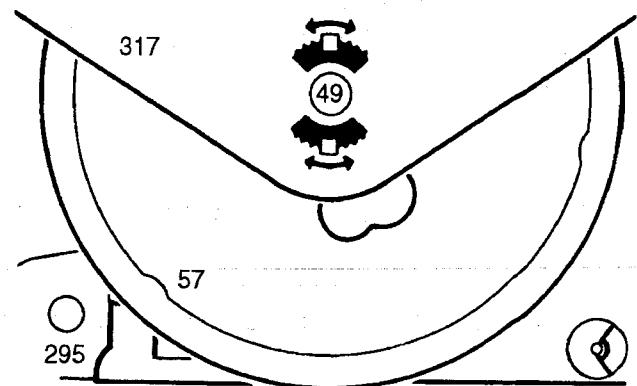
**Fig. E**



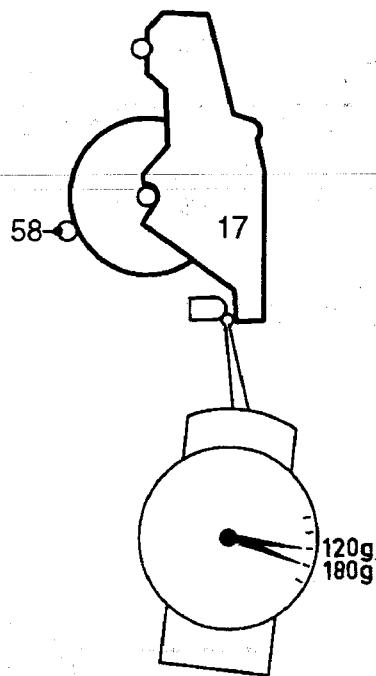
**Fig. F**



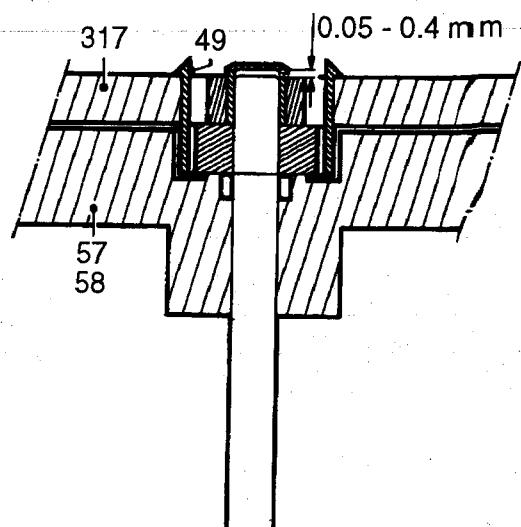
**Fig. G**



**Fig. H**

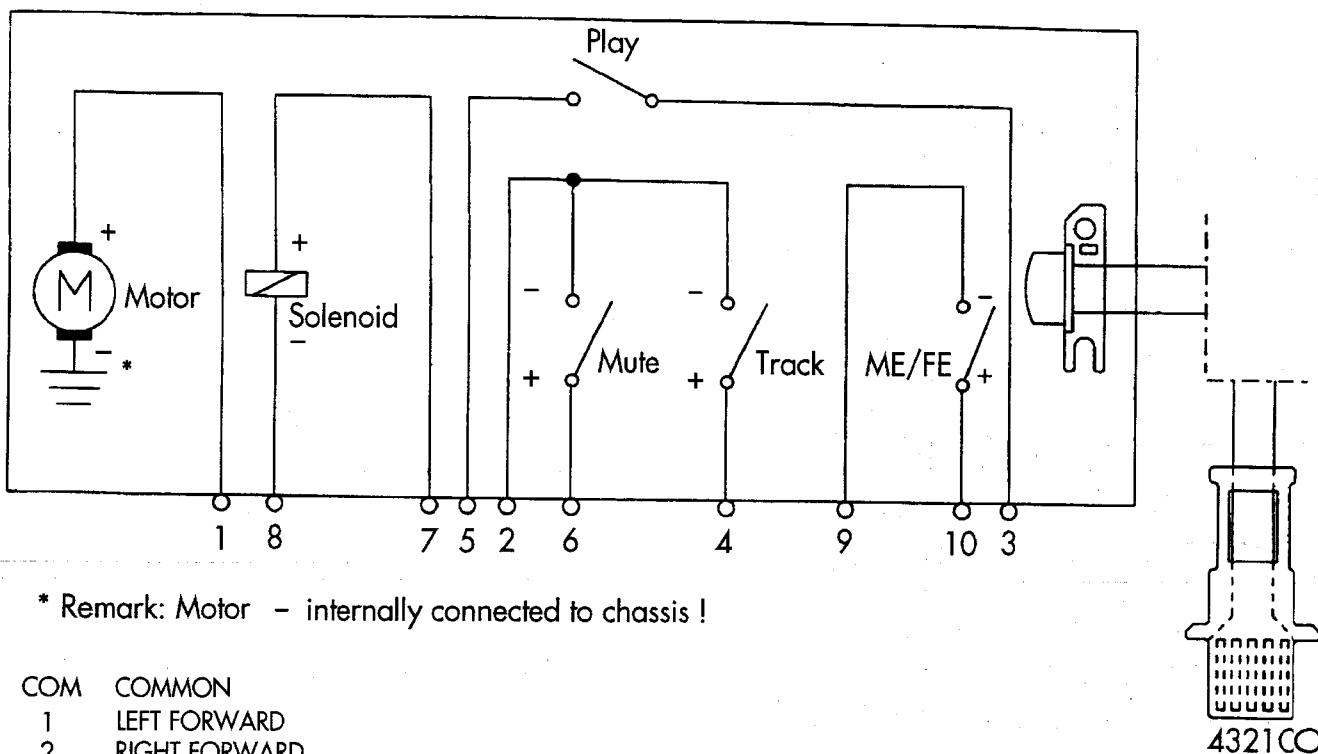


**Fig. I**



**Fig. J**

## CONNECTIONS



COM COMMON  
1 LEFT FORWARD  
2 RIGHT FORWARD  
3 RIGHT REVERSE  
4 LEFT REVERSE

Fig. K

Fig. N

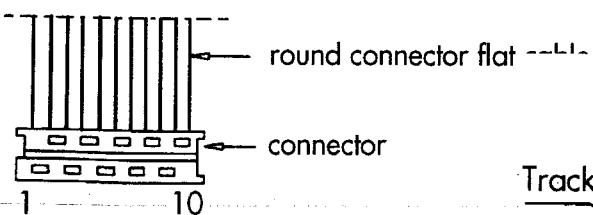


Fig. L

wire	colour	function
1	red	Motor+
2	brown	COMMON
3	orange	+14V
4	yellow	Track SW
5	green	Play SW
6	blue	Mute SW
7	violet	+ Solenoid
8	grey	- Solenoid
9	white	- ME/FE
10	black	+ ME/FE

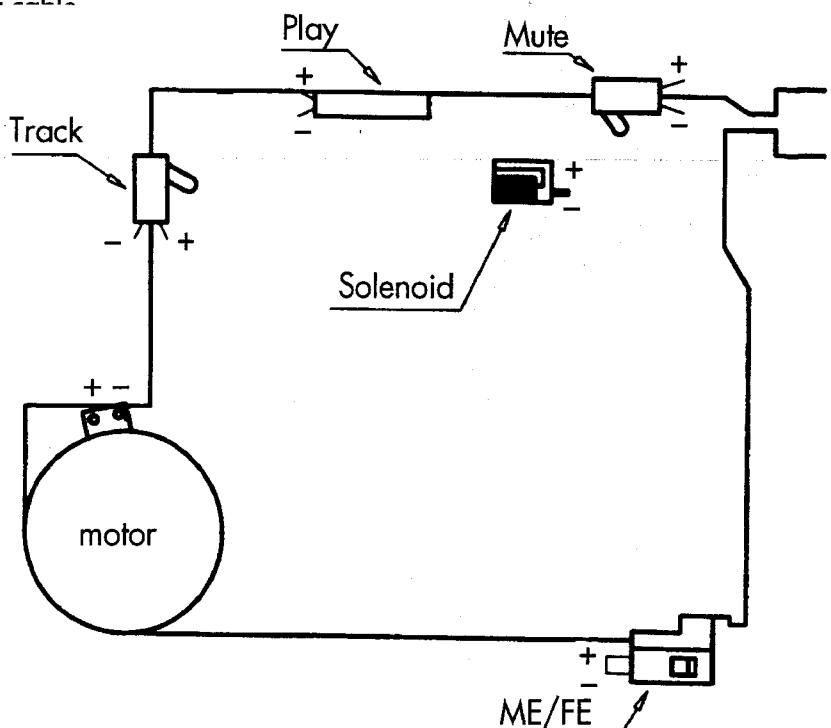
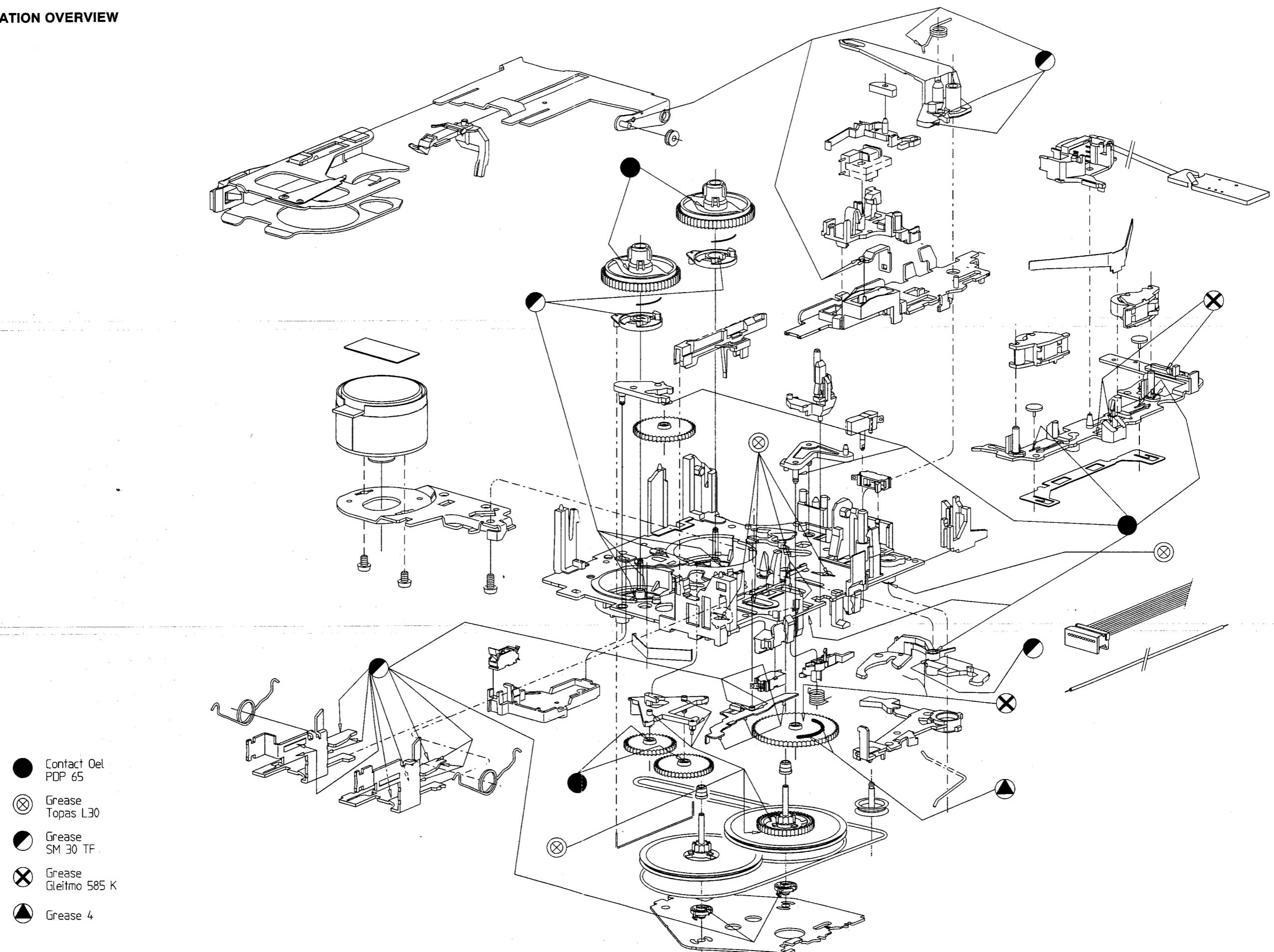


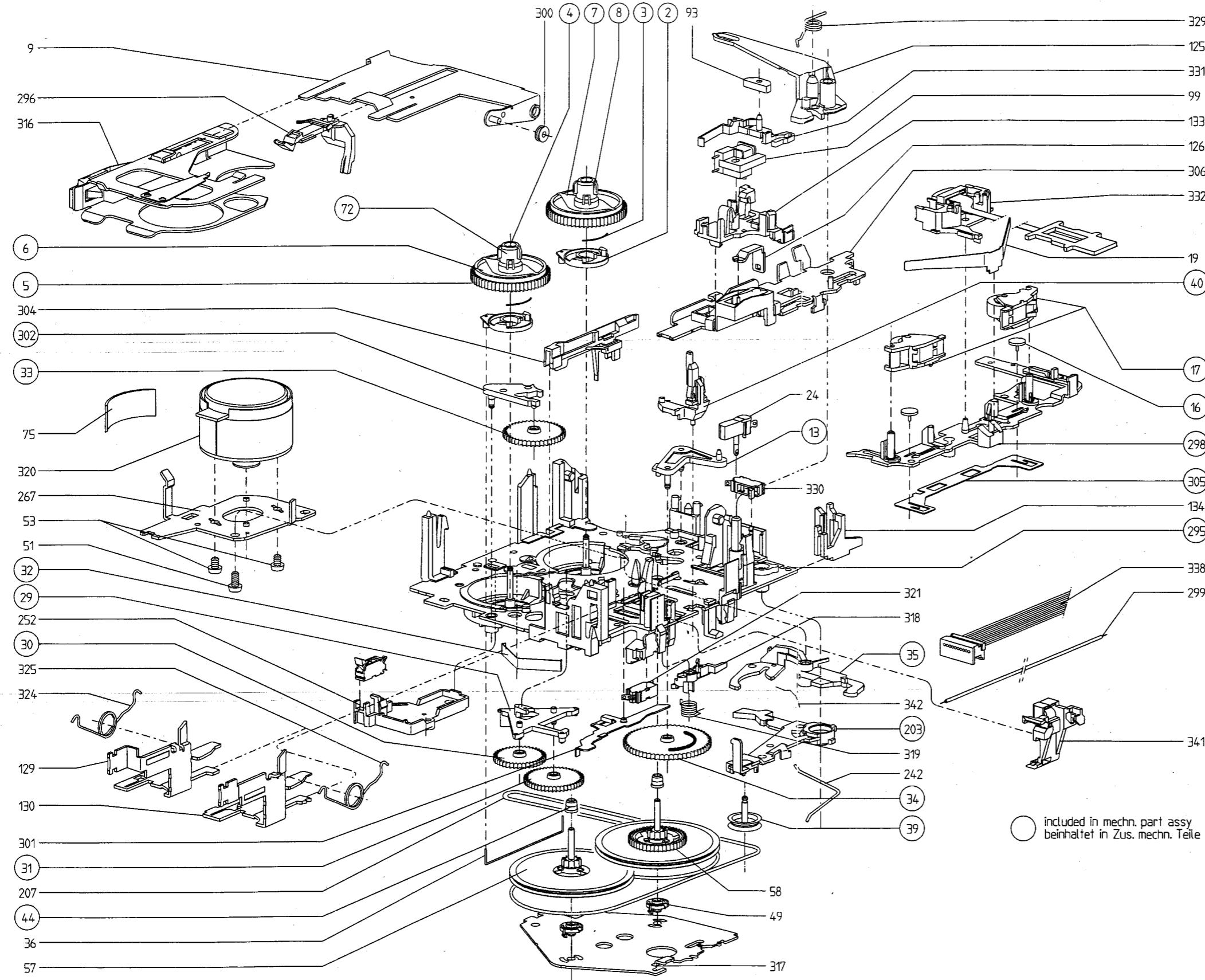
Fig. O

Fig. M

## LUBRICATION OVERVIEW



## **EXPLODED VIEW**



## PARTS LISTS

2/3	4822 466 70527	Disc assy
4/5/6/7/8	4822 466 70526	Coupling felt assy white
4/5/6/7/72	4822 528 10898	Coupling felt assy black
9	4822 466 81479	Cassette lift
16	4822 528 80983	Fixation
17	4822 403 40157	Pressure roller assy
24	4822 276 13081	Play switch
29/30/31	4822 522 20327	Gear assy
32	4822 492 71468	Leaf spring
35	4822 403 52031	Gear arm
36	4822 492 90076	Lever
39	4822 528 81144	Pulley
40	4822 403 10225	Holder
44	4822 520 30406	Bush bearing
49	4822 520 30407	Excentric
53	4822 502 12548	Special screw
54/207	4822 358 30405	Driving belt
58	4822 528 81517	Fly wheel assy
93	4822 281 60165	Anchor plate
99	4822 281 50113	Solenoid magnet
125	4822 403 71287	Lever eject
126	4822 403 71286	Lever blocking
133	4822 466 83076	Plate solenoid II
203	4822 404 21169	Arm
296	4822 256 92317	Holder cassette
298	4822 403 71282	Head support bracket
304	4822 462 30632	Band conductor
306	4822 403 71283	Push button rod
318	4822 403 71284	Latch
319	4822 492 42774	Spring latch
320	4822 361 21764	Motor MSI-5 CCW
321	4822 276 13617	Switch mute
330	4822 276 13616	Switch track
331	4822 403 71285	Lever solenoid
332	4822 249 30227	Magnetic head
	4822 691 10438	Deck LCA2.4 complete

### **Lubrication greases/oils**

4822 390 10107 Isoflex PDP 65, 30ML  
4822 390 20128 Isoflex TOPAS L 30  
4822 390 20116 Grease 004, 100G CAN  
4822 390 20128 Isoflex TOPAS L 30

**Service  
Service  
Service****Supplement****PHIL -05363**

# Service Manual

**12 V**

This supplement should be used together with the LCA 2.4 Service Manual with service code:  
**4822 725 23523.**

**4728**

This supplement contains: technical data, general information, connector and switch overviews, exploded views and partslists for both the LCA 5.2 and LCA 5.4 tape decks.  
For all parts not mentioned here, refer to the LCA 2.4 Service Manual.

## TECHNICAL DATA

Operating voltage	: 9 - 16V (nom. 13.2V)
Tape speed	: 4.76cm/sec ± 0.5%
Wow & Flutter	: ≤ 0.35% RMS (+10 - +45°C)
Crosstalk (track 2-3)	: < -40dB
Fast wind time	: ≤ 115sec (C-60)
Number of tracks	: 2x2
Channel separation (Tracks 1-2/3-4)	: > 35dB

**PHILIPS****5363**

## **GENERAL**

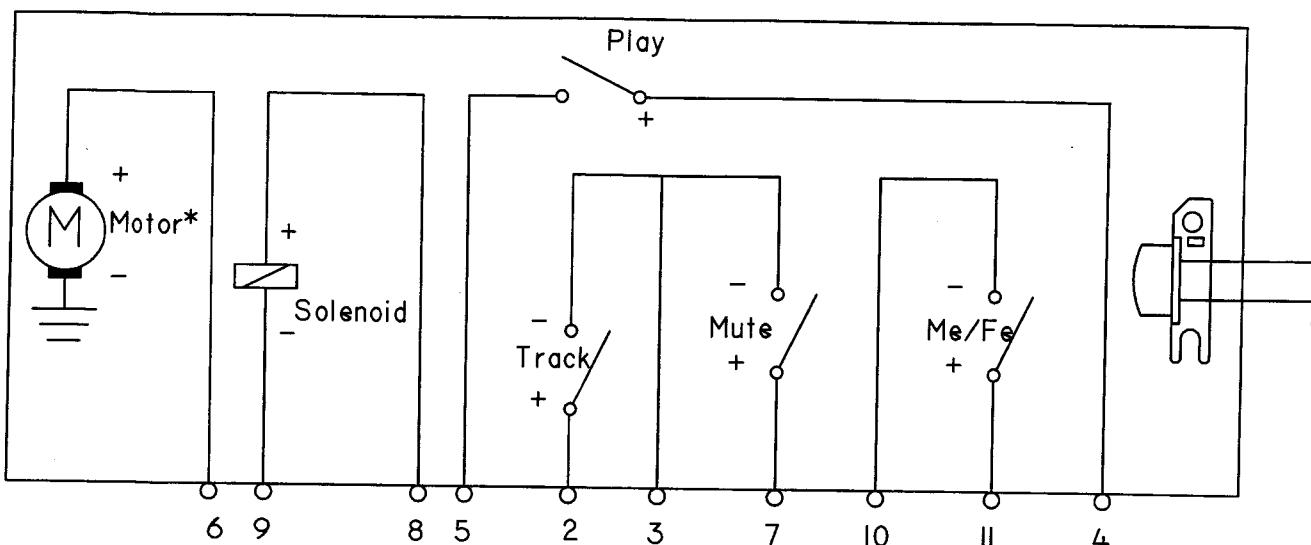
The differences between the LCA 2.4 and **LCA 5.2** are:

- capstan motor at left side instead of rear
- no "Key-Off" standby
- no Automatic Music sensor system
- no Metal / Ferro tape selector switch
- interface connector
- changed position of wind buttons

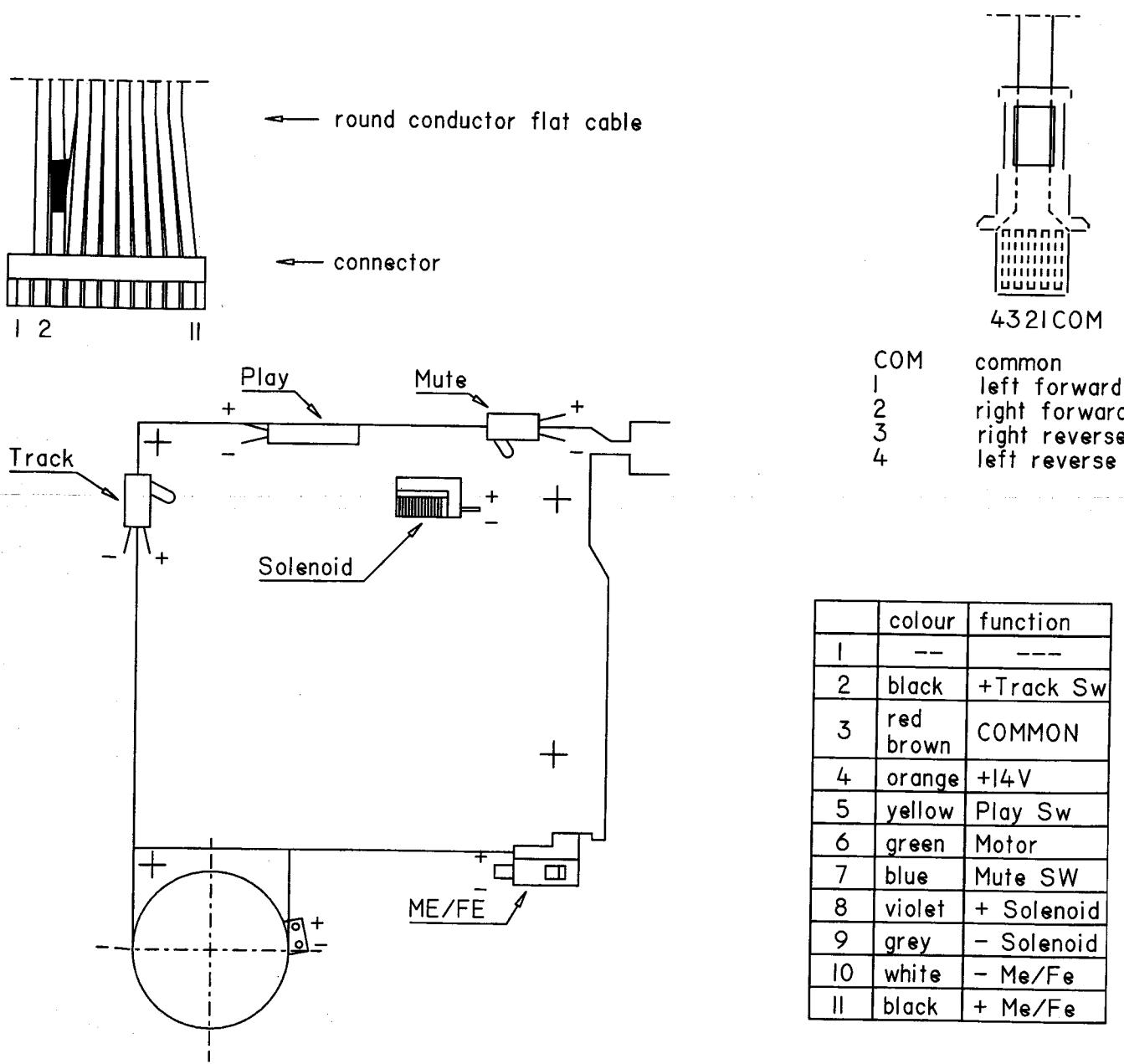
The differences between the LCA 2.4 and **LCA 5.4** are:

- capstan motor at left side instead of rear
- interface connector
- changed position of wind buttons

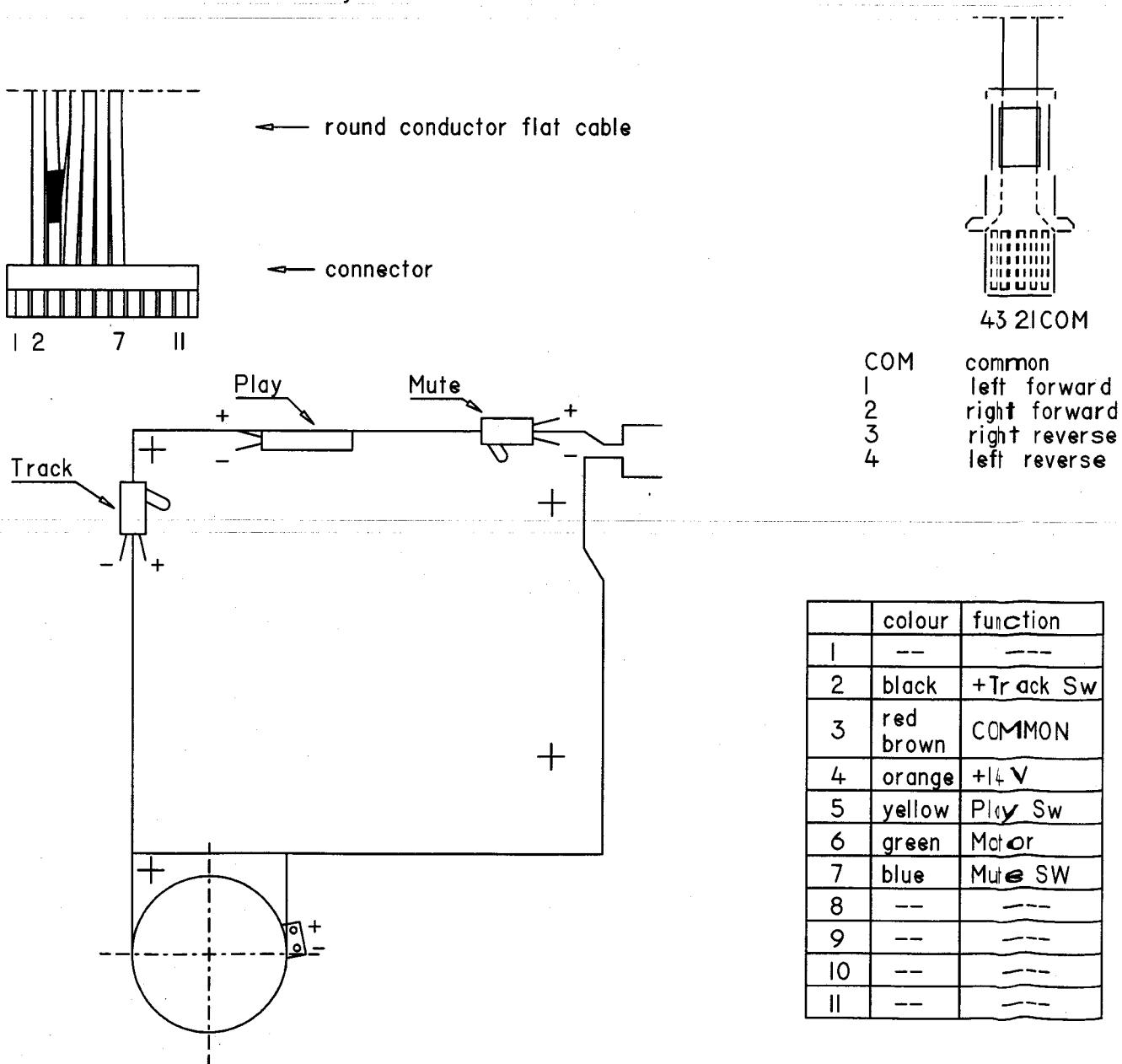
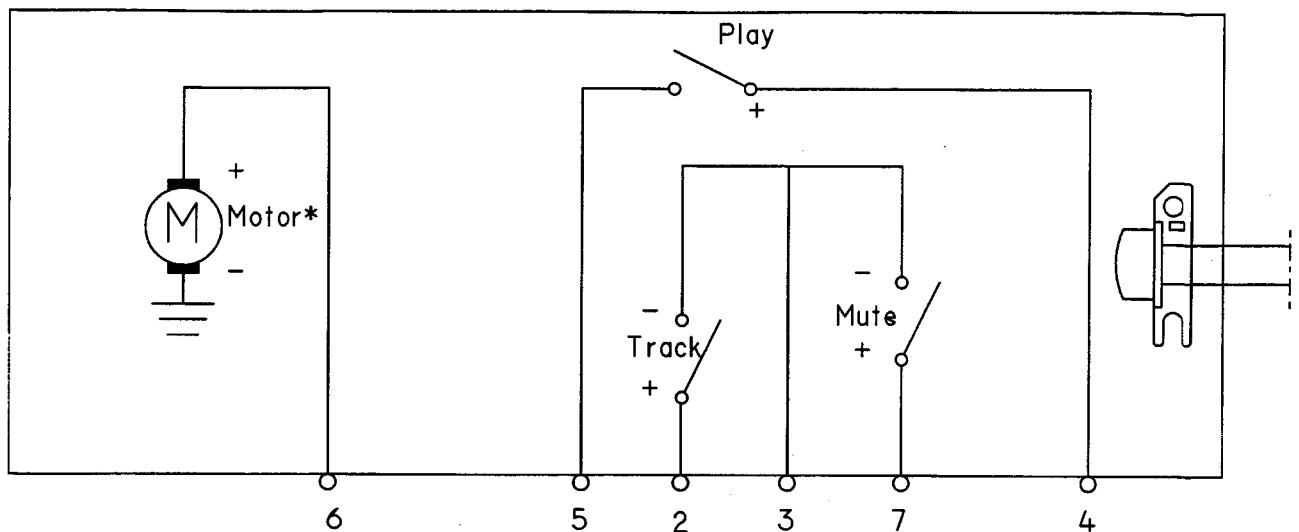
## LCA 5.4 CONNECTOR AND SWITCH OVERVIEW



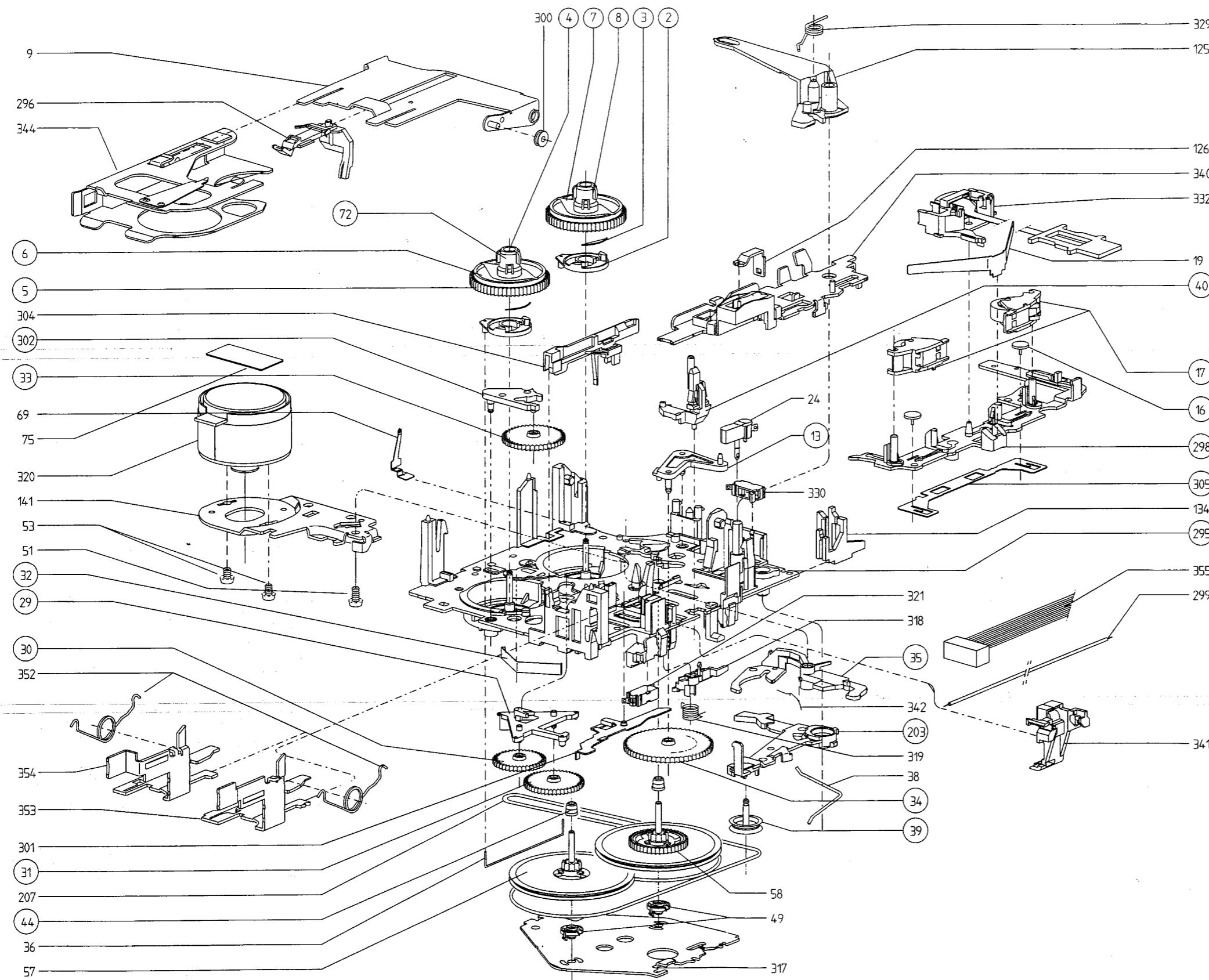
\*Remark: Motor - internally connected to chassis!



## LCA 5.2 CONNECTOR AND SWITCH OVERVIEW



LCA 5.2 EXPLODED VIEW



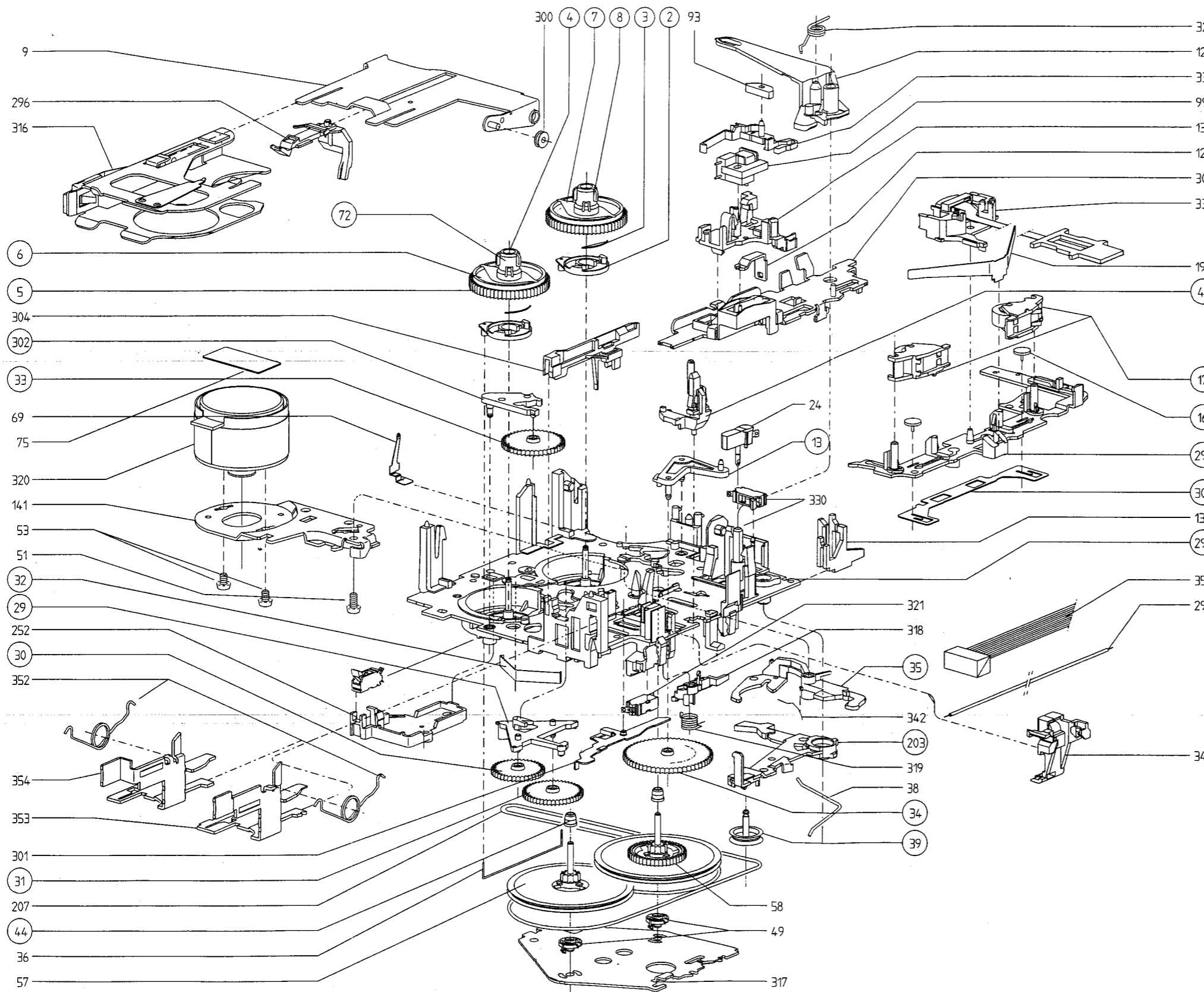
PARTS LIST LCA5.2

2/3	4822 466 70527	Disc assy
4/5/6/7/8	4822 466 70526	Coupling felt assy white
4/5/6/7/72	4822 528 10898	Coupling felt assy black
9	4822 466 81479	Cassette lift
16	4822 528 80983	Fixation
17	4822 403 40157	Pressure roller assy
24	4822 276 13081	Play switch
29/30/31	4822 522 20327	Gear assy
32	4822 492 71468	Leaf spring
35	4822 403 52031	Gear arm
36	4822 492 90076	Lever
39	4822 528 81144	Pulley
40	4822 403 10225	Holder
44	4822 520 30406	Bush bearing
49	4822 520 30407	Excentric
53	4822 502 12548	Special screw
57	4822 528 80985	Flywheel assy
58	4822 528 81517	Flywheel assy
125	4822 403 71287	Lever eject
126	4822 403 71286	Lever blocking
203	4822 404 21169	Arm
207	4822 358 31136	Driving belt
296	4822 256 92317	Holder cassette
298	4822 403 71282	Head support bracket
300	4822 528 10942	Lift roller
301	4822 466 10758	Plate logic
304	4822 462 30632	Band conductor
305	4822 466 10759	Control plate
318	4822 403 71284	Latch
319	4822 492 42774	Spring latch
320	4822 361 21764	Motor MSI-5 CCW
321	4822 276 13617	Switch mute
330	4822 276 13616	Switch track
332	4822 249 30227	Magnetic head
340	4822 402 10106	Push button rod
344	4822 256 10151	Cassette carrier assy
	4822 691 10466	Deck LCA5,2 complete

#### **Lubrication greases/oils**

4822 390 10107	Isoflex PDP <b>65</b> , 30ML
4822 390 10133	Grease <b>55K</b>
4822 390 10134	Grease <b>L30TF</b>
4822 390 20116	Grease <b>004</b> , 100G CAN
4822 390 20128	Isoflex <b>TOPAS</b> L 30

## LCA 5.4 EXPLODED VIEW



## PARTS LIST LCA5.4

2/3	4822 466 70527	Disc assy
4/5/6/7/8	4822 466 70526	Coupling felt assy white
4/5/6/7/72	4822 528 10898	Coupling felt assy black
9	4822 466 81479	Cassette lift
16	4822 528 80983	Fixation
17	4822 403 40157	Pressure roller assy
24	4822 276 13081	Play switch
29/30/31	4822 522 20327	Gear assy
32	4822 492 71468	Leaf spring
35	4822 403 52031	Gear arm
36	4822 492 90076	Lever
39	4822 528 81144	Pulley
40	4822 403 10225	Holder
44	4822 520 30406	Bush bearing
49	4822 520 30407	Excentric
53	4822 502 12548	Special screw
57	4822 528 80985	Flywheel assy
58	4822 528 81517	Flywheel assy
93	4822 281 60165	Anchor plate
99	4822 281 50113	Solenoid magnet
125	4822 403 71287	Lever eject
126	4822 403 71286	Lever blocking
133	4822 466 83076	Plate solenoid II
203	4822 404 21169	Arm
207	4822 358 31136	Driving belt
296	4822 256 92317	Holder cassette
298	4822 403 71282	Head support bracket
300	4822 528 10942	Lift roller
301	4822 466 10758	Plate logic
304	4822 462 30632	Band conductor
305	4822 466 10759	Control plate
306	4822 403 71283	Push button rod
318	4822 403 71284	Latch
319	4822 492 42774	Spring latch
320	4822 361 21764	Motor MSI-5 CCW
321	4822 276 13617	Switch mute
330	4822 276 13616	Switch track/ME-FE
331	4822 403 71285	Lever solenoid
332	4822 249 30227	Magnetic head
344	4822 256 10151	Cassette carrier assy
	4822 691 10467	Deck LCA5.4 complete

## Lubrication greases/oils

4822 390 10107	Isoflex PDP 65, 30ML
4822 390 10133	Grease 585K
4822 390 10134	Grease L30TF
4822 390 20116	Grease 004, 100G CAN
4822 390 20128	Isoflex TOPAS L 30